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SPX Corporation

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IMPORTANT NOTICES

SAFETY DEFINITIONS

Follow all **DANGER**, **WARNING**, **IMPORTANT**, and **Notes** messages in this manual. These safety messages are defined and formatted as follows:

DANGER: Means you risk possible loss of life.

WARNING: Means you risk bodily harm.

IMPORTANT: Means that the information demands special attention or that you risk damage to the vehicle or the tool.

Note: *Provide clarity and helpful tips.*

The safety messages cover situations SPX is aware of. SPX cannot know, evaluate or advise you as to all of the possible hazards. You must be certain that any conditions or service procedures encountered do not jeopardize your personal safety.

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SAFETY PRECAUTIONS

DANGER: When an engine is operating, keep the service area WELL VENTILATED or attach a building exhaust removal system to the engine exhaust system. Engines produce carbon monoxide, an odorless, poisonous gas that causes slower reaction time and can lead to serious personal injury or loss of life.

WARNINGS:

- **When working with hydraulic or fuel lines, liquids under pressure may escape and create a dangerous condition. Use adequate ventilation and make sure there are no sparks or possibility of sparks present that may ignite any vapor.**

- **Wear an American National Standards Institute (ANSI) approved eye shield when testing or repairing vehicles. Objects propelled by whirling engine components or pressurized liquids escaping may cause personal injury.**

- **Set the parking brake and block the wheels before testing or repairing a vehicle. It is especially important to block the wheels on front-wheel drive vehicles because the parking brake does not hold the drive wheels.**
- **Do not drive the vehicle and operate the scan tool at the same time. Any distractions may cause an accident. Have one person operate the scan tool as another person drives the vehicle.**

- **Maintain adequate clearance around moving components or belts during testing. Moving components and belts can catch loose clothing, body parts, or test equipment and cause serious damage or personal injury.**

- **Automotive batteries contain sulfuric acid and produce explosive gases that can result in serious injury. To prevent ignition of gases, keep lit cigarettes, sparks, flames, and other ignition sources away from the battery at all times.**

- **Refer to the service manual for the vehicle being serviced and adhere to all diagnostic procedures and precautions. Failure to do so could result in personal injury or otherwise unneeded repairs.**

IMPORTANT: To avoid damage to the scan tool or generation of false data, make sure the vehicle battery is fully charged and the connection to the vehicle DLC is clean and secure.

IMPORTANT: Do not place the scan tool on the distributor of a vehicle. Strong electro-magnetic interference can damage the scan tool.

Introduction

This ***User Guide*** provides operating instructions for the scan tool diagnostic, system setup, and playback functions. It is a companion manual to the printed ***Quick Start Guide*** that you received with the scan tool as follows:

When the scan tool is first turned on, the Application Manager screen displays the test options.

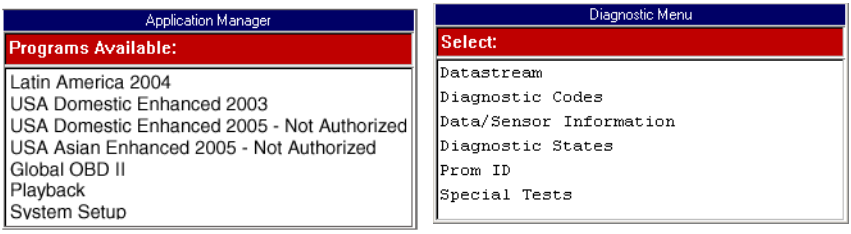


Figure 1.1: Application Manager Screen and Diagnostic Menu Screen

- **Latin America 2004, USA Domestic Enhanced 2003, USA Domestic Enhanced 2005, USA Asian Enhanced 2005** and **Global OBD II —** these options are for vehicle diagnostic testing. They require that you enter vehicle information into the scan tool and connect a cable between the scan tool and the vehicle. After you do this, the Diagnostic Menu screen (shown above) displays the diagnostic functions for the vehicle. The ***Quick Start Guide*** provides the steps for entering the vehicle information, connecting the cable, and displaying the Diagnostic Menu screen. This ***User Guide*** provides detailed procedures for using each of the diagnostic functions listed on the Diagnostic Menu screen: **Datastream, Diagnostic Codes, Data / Sensor Information, Diagnostic States, Prom ID,** and **Special Tests**.
- **Playback** and **System Setup —** these options do not require a vehicle connection. The ***Quick Start Guide*** provides introductory steps for these functions. This ***User Guide*** provides detailed procedures for using these functions.

IMPORTANT: The procedures in this ***User Guide*** assume you have read the ***Quick Start Guide*** and are familiar with the scan tool and the ScanMate PC software.

Note: *The Diagnostic Menu screen shown above is only an example; it shows all possible options.*

Datastream

The Datastream function lets you view live data readings from the selected electronic control module (ECM).

Basic Procedure

1 Follow the instructions in *"Test Startup and Vehicle Connection"* in the ***Quick Start Guide*** to display the Diagnostic Menu screen.

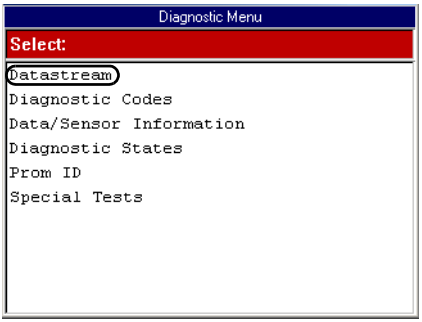


Figure 2.1: Diagnostic Menu Screen

2 Select **Datastream** and press the **ENTER** key. This displays either a Datastream Groups screen or a PCM Selection Menu screen.

Note: *If neither of these screens appear, skip step 3.*

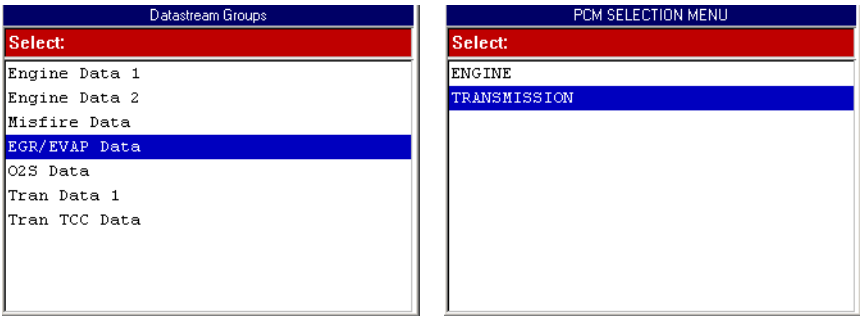


Figure 2.2: Datastream Groups Screen and PCM Selection Menu Screen

3 **Select an option** and press the **ENTER** key. This displays the Datastream screen.

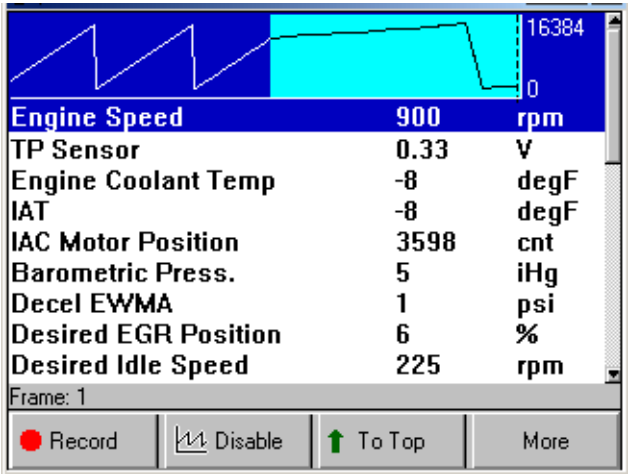


Figure 2.3: Datastream Screen

4 Notice the following about the Datastream screen:

- Each line displays a data item. The first time you test a vehicle, the top line is displayed in Graph format and the remaining lines are displayed in Digital format. (See "**Remembered Settings**" on page 22.)
- You use the **Up** and **Down Arrow** keys to scroll through the data lines and to select a line.
- The screen's data updates as the software reads from the vehicle's ECM. Each update is called a "frame" of data.
- The function keys at the bottom of the screen (Record, Disable, To Top, and More) let you perform several other functions on the screen. For details, refer to the next section, "**Functions Overview**" on page 8.
- The status line (above the function keys) displays the current frame number and other software status information.
- You can stop and start the live readings at any time. When you stop the readings, the data "freezes" on the screen. For details, refer to "**Freeze Frame**" on page 13.

5 When you are finished using the screen, use the **EXIT** key to return to previous screens.

Functions Overview

There are several functions you can use on the Datastream screen. Most of them are activated using the function buttons on the screen. These functions, described in detail on the next few pages, include the following:

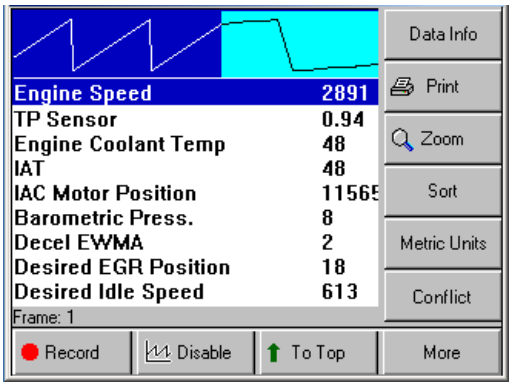


Figure 2.4: Datastream Screen Function Buttons

- **Record —** saves ("records") the data for viewing again at a later time. (See page 9.)
- **Graph / Disable (Digital) —** changes the format of a selected line from digital to graphical, or vice versa. (See page 11.)
- **To Top —** moves one selected data line to the top of the screen. (See page 12.)
- **Freeze Frame —** temporarily stops the live data readings and lets you view past data. (See page 13.)

Note: *The following functions are on the More menu that appears when you press the More function key.*

- **Data Info —** displays vehicle-specific, sensor and switch descriptions and typical data values. (See page 14.)
- **Print —** prints the current data display. (See page 16.)
- **Zoom —** enlarges the view of a data line. (See page 17.)
- **Sort —** rearranges the data lines either alphabetically or with graphed or selected ("locked") lines at the top. (See page 18.)
- **English / Metric Units —** changes the units of measure for the data from English to Metric, or vice versa. (See page 20.)
- **Conflict** (not shown above) **—** for Global OBD II testing, shows details when two or more PCMs are reading conflicting data for a sensor or switch. (See page 21.)

Note: *There are a couple of automatic Datastream functions:* ***Remembered Settings*** *and* ***DTC-Triggered Record****. They are described on page 22.*

Record

The Record function lets you save up to five (5) data files of up to 150 frames of data (75 frames that occur before pressing the Record function key and 75 frames that occur after pressing the key). You can then use the Playback function to view the saved files.

Note: *The length of time for each frame varies per vehicle. Generally, one frame of data is about 1/4 of a second, or 4 frames per second.*

1 Follow the steps in "**Basic Procedure**" on page 6 to display the Datastream screen.

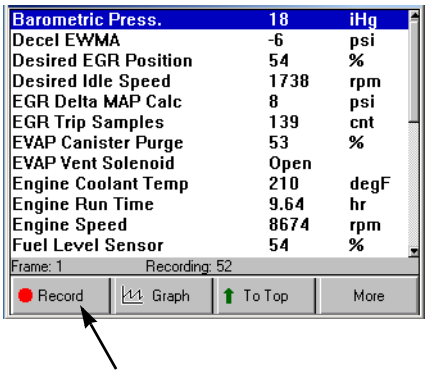


Figure 2.5: Record Function

2 The recording includes all data lines that are within view on the screen and locked and graphed lines that are not in view on the screen. Optionally, do any of the following to select data lines to include in the recording:

- To lock a line, **select the line** and then press the **ENTER** key. This places a padlock icon at the left side of the line. Repeat this for as many lines as you want to lock and include in the recording.

  Note: *To unlock a line, select the line again and press the ENTER key again. This removes the padlock icon from the left side of the line.*

- To change a line to the Graph view, **select the line** and press the **Graph** function key. For details, refer to "**Graph / Disable (Digital)**" on page 11.
- To move a line to the top, **select the line** and press the **To Top** function key. For details, refer to "**To Top**" on page 12.

3 Press the **Record** function key (*Figure 2.5* on page 9). This does the following:

- Temporarily shades the Record function key.
- Automatically records the past 75 frames of data that occurred before pressing the key (or however many have occurred if less than 75), continues recording the next 75 frames of data as they occur, and then stops recording.

  Note: *To record less than 150 frames of data, press the EXIT key at any time. This stops the recording and saves only the frames already captured.*

- Displays a countdown on the status line of the number of frames left to be recorded (from Recording: 75 to Recording:1). When the countdown reaches 1, the recorded data is saved as an Event file and placed in a Playback folder.

  Note: *The playback folder holds up to five (5) Event files. When you record more than five files, new recordings overwrite the old ones. For details, refer to "**Playback**" on page 78.*

4 When the recording stops, continue viewing live data or use the **EXIT** key to return to previous screens.

5 To view the saved data file, refer to "***Playback***" on page 78.

Graph / Disable (Digital)

The Graph/ Disable function lets you change the format for each line on the Datastream screen from digital to graphical, or vise versa.

- When a line is displayed as Digital, its reading is a word or a number, as shown for all the lines in the screen on the left side in *Figure 2.6*.
- When a line is displayed as a Graph, its reading is a line graph as shown for the top line in the screen on the right side in *Figure 2.6*. The graph has a past activity section and a magnified live activity window. The minimum and maximum measurements appear to the right of the graph and the digital reading is below the graph. You can use the Left and Right Arrow keys to move the magnified window through the data. Refer to "**Freeze Frame**" on page 13.

1 Follow the steps in "**Basic Procedure**" on page 6 to display the Datastream screen.

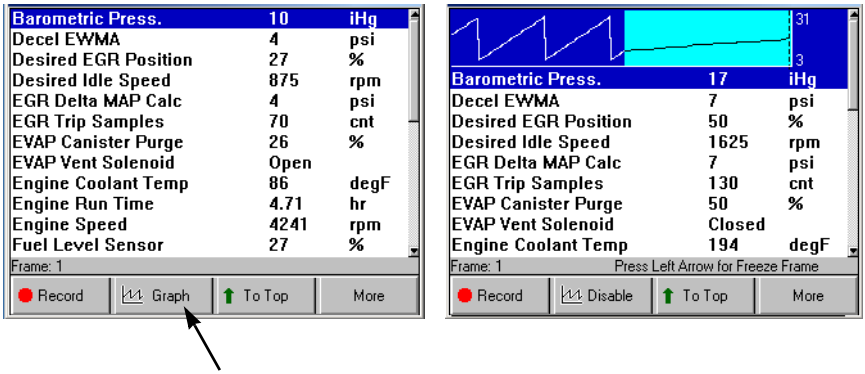


Figure 2.6: Graph / Digital Display Function

2 **Select the line** to change.

3 Press the **Graph / Disable** function key.

Note: *When you press the key, the name of this function key changes to represent the display type that will appear the next time you press the key.*

4 Repeat steps 2 and 3 for each line to change.

To Top

The To Top function lets you move a selected data line to the top of the Datastream screen.

Note: *You can also use the Sort function to rearrange the data lines. For details, refer to "**Sort**" on page 18.*

1 Follow the steps in "**Basic Procedure**" on page 6 to display the Datastream screen.

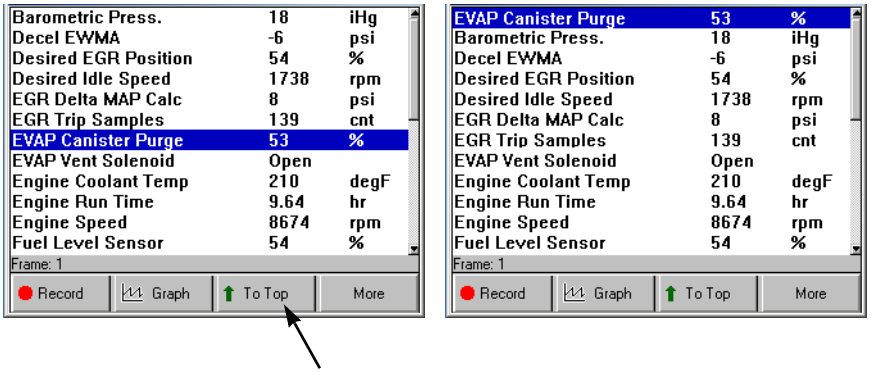


Figure 2.7: To Top Function — Before and After

2 **Select the line** to move.

3 Press the **To Top** function key to move the line.

4 Repeat steps 2 and 3 for each line to move.

Freeze Frame

The Freeze Frame function lets you temporarily stop the live datastream readings and view past data frame-by-frame.

1 Follow the steps in "**Basic Procedure**" on page 6 to display the Datastream screen.

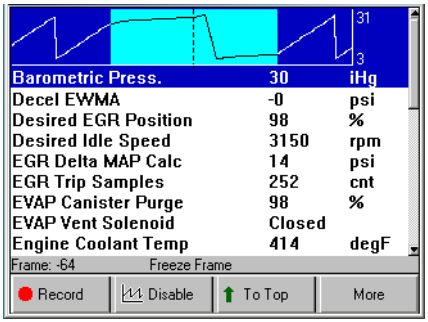


Figure 2.8: Freeze Frame Function

2 Use the **Left Arrow** key to begin the freeze function.

3 Repeatedly press the **Left Arrow** key to move backward through the data. Notice the following:

- The Frame number (above the Record key) changes to show the frame number of the currently-displayed data.
- The message next to the frame number flashes as "Freeze Frame" and "Exit to resume".
- On any displayed graphs, the vertical, dashed-line moves to display the past data for each frame.
- On any displayed digital lines, the data changes to display the past data for each frame.

4 Use the **Left** and **Right Arrow** keys to move backward or forward through the data, frame-by-frame.

5 When finished, press the **EXIT** key to resume the live readings.

Data Info

The Data Info function on the Datastream screen's More menu lets you view vehicle-specific, sensor and switch descriptions and typical data values.

Note: *The Data / Sensor Information function is also available directly from the Diagnostic Menu screen. For details, refer to "**Data / Sensor Information**" on page 65.*

1 Follow the steps in "**Basic Procedure**" on page 6 to display the Datastream screen.

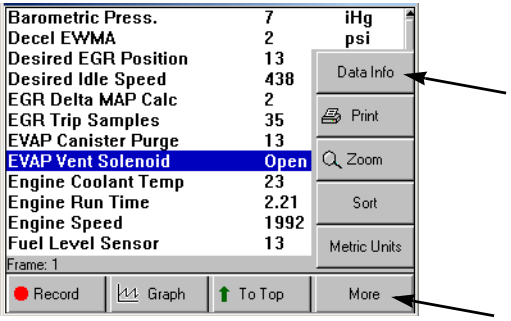


Figure 2.9: More Menu

2 Press the **More** function key.

3 Select **Data Info** and press the **ENTER** key.

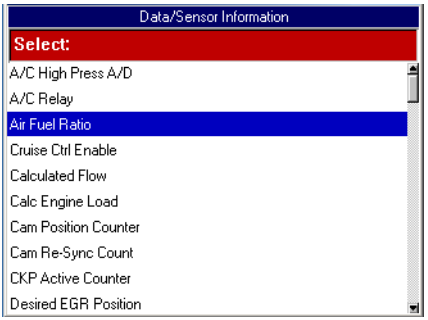


Figure 2.10: Data / Sensor Information Screen

4 **Select an item** and press the **ENTER** key.

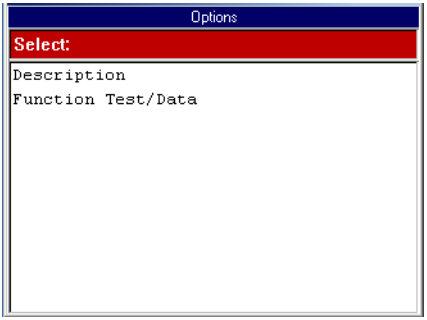


Figure 2.11: Options Screen

5 Select an option as follows:

- Select **Description** to view a description of the selected sensor or switch.
- Select **Function Test / Data** to view the typical value or other information about the selected sensor or switch.

6 Press the **ENTER** key to display the next screen, either the Description or Function Test / Data screen.

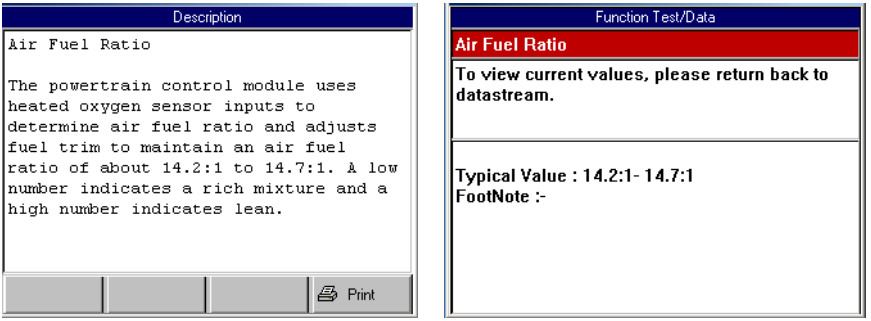

Description
Air Fuel Ratio
The powertrain control module uses heated oxygen sensor inputs to determine air fuel ratio and adjusts fuel trim to maintain an air fuel ratio of about 14.2:1 to 14.7:1. A low number indicates a rich mixture and a high number indicates lean.
Print
Function Test/Data
Air Fuel Ratio
To view current values, please return back to datastream.
Typical Value : 14.2:1- 14.7:1
FootNote :-

Figure 2.12: Description Screen and Function Test / Data Screen

7 View the information (and optionally print the description).

8 After viewing the information, use the **EXIT** key to return to previous screens.

Print

The Print function on the Datastream screen's More menu lets you print a text listing of data through the ScanMate PC software on a connected PC.

1 Follow the steps in "**Basic Procedure**" on page 6 to display the Datastream screen.

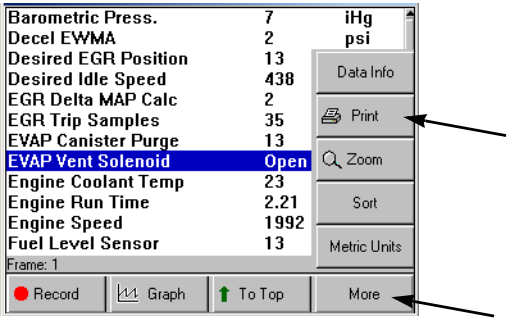


Figure 2.13: More Menu

2 The printout includes all data lines that are within view on the screen, and locked and graphed lines that are not in view on the screen. Optionally, do any of the following to select data lines to include in the printout:

- To lock a line, **select the line** and then press the **ENTER** key. This places a padlock icon at the left side of the line. Repeat this for as many lines as you want to lock and include in the printout.

  Note: *To unlock a line, select the line again and press the ENTER key again. This removes the padlock icon from the left side of the line.*

- To change a line to the Graph view, **select the line** and press the **Graph** function key. For details, refer to "**Graph / Disable (Digital)**" on page 11.
- To move a line to the top, **select the line** and press the **To Top** function key. For details, refer to "**To Top**" on page 12.

3 Make sure the ScanMate PC software is prepared for printing. (Refer to "*Scan Tool Printing Procedure"* in the ***Quick Start Guide***).

4 On the scan tool, press the **More** function key.

5 Select **Print** and press the **ENTER** key.

6 View and print the data on the PC.

Zoom

The Zoom function on the Datastream screen's More menu lets you magnify the view of each data line on the Datastream screen.

Note: *The function can be used for the normal display or for a "frozen" display.*

1 Follow the steps in "**Basic Procedure**" on page 6 to display the Datastream screen.

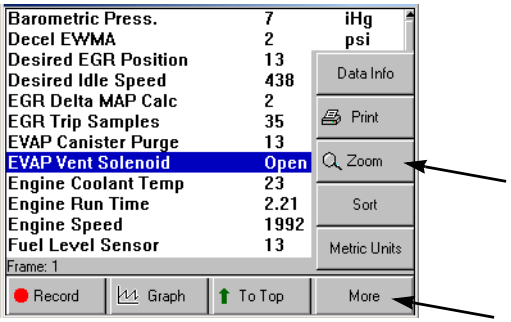


Figure 2.14: More Menu

2 **Select the line** to change.

3 Press the **More** function key.

4 Select **Zoom** and press the **ENTER** key to magnify the line.

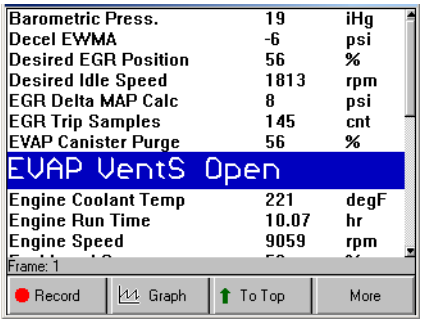


Figure 2.15: Zoom Function

Note: *To remove the "Zoom" view from a line, select the line and the Zoom menu option again.*

Sort

The Sort function on the Datastream screen's More menu lets you rearrange the data on the Datastream screen either alphabetically or with graphed or selected ("locked") lines at the top of the screen.

Note: *You can also use the To Top function to rearrange the data lines. For details, refer to "**To Top**" on page 12.*

1 Follow the steps in "**Basic Procedure**" on page 6 to display the Datastream screen.

2 Optionally, do the following to "lock" lines or change the view of lines to "graph":

- To lock a line, **select the line** and then press the **ENTER** key. This places a padlock icon at the left side of the line, as shown in *Figure 2.16*. Repeat this for as many lines as you want to lock and move to the top of the screen.

  Note: *To unlock a line, select the line again and press the ENTER key again. This removes the padlock icon from the left side of the line.*

- To change a line to the Graph view, **select the line** and press the Graph function key. For details, refer to "**Graph / Disable (Digital)**" on page 11.

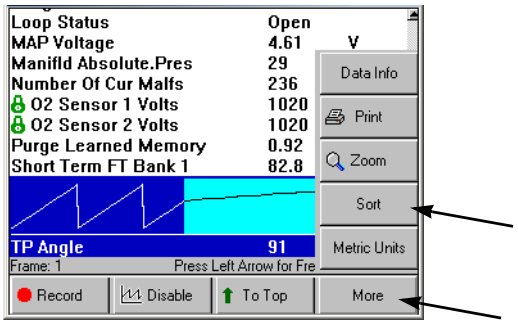


Figure 2.16: More Menu

3 Press the **More** function key.

4 Select **Sort** and press the **ENTER** key.

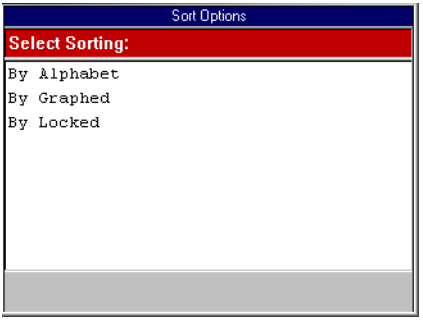


Figure 2.17: Sort Options Screen

5 From the Sort Options screen, select one of the following:

- Select **By Alphabet** to sort the data alphabetically.
- Select **By Graphed** to move all the graphed lines to the top of the screen.
- Select **By Locked** to move all the locked lines to the top of the screen.

6 Press the **ENTER** key to display the rearranged lines.

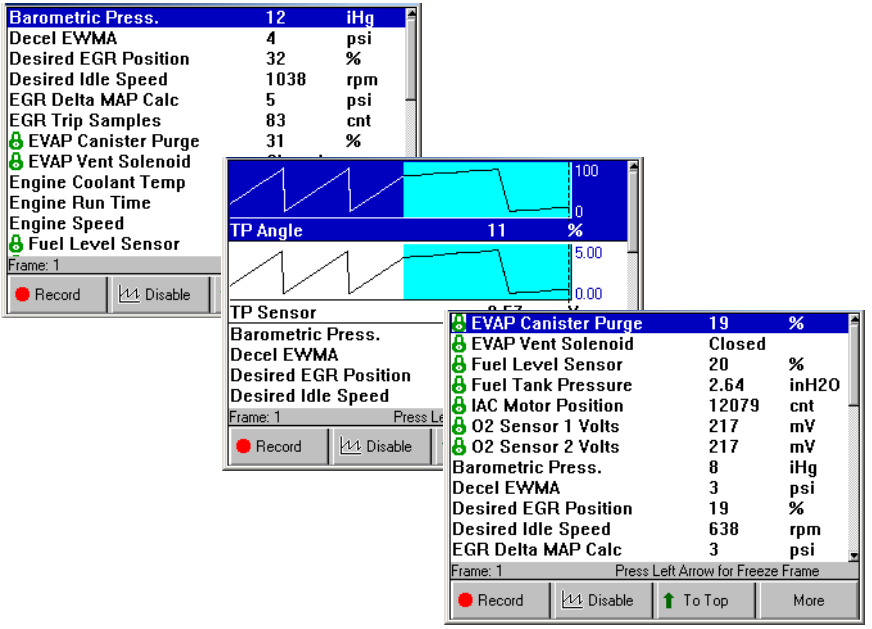


Figure 2.18: Sort Function Results: By Alphabet, Graph, and Locked

English / Metric Units

The English / Metric Units function on the Datastream screen's More menu lets you change the units-of-measure for the data from English to Metric, or vice versa.

1 Follow the steps in "**Basic Procedure**" on page 6 to display the Datastream screen.

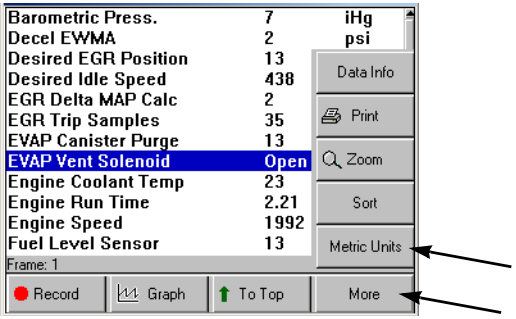


Figure 2.19: More Menu

2 Press the **More** function key.

3 Select **English Units** or **Metric Units** and press the **ENTER** key.
This displays the data in the selected units-of-measure.

Note: *When you select this menu option, the name changes to represent the units-of-measure that will appear the next time you select it (English or Metric).*

Conflict

The Conflict function on the Datastream screen's More menu lets you view detailed information when two or more powertrain control modules (PCMs) are reading data for the same sensor or actuator, but the readings do not match (there is a conflict). This function works only when you are using Global OBD II testing and when one or more lines on the Datastream screen are grey, indicating a conflict.

1 Follow the steps in "**Basic Procedure**" on page 6 to display the Datastream screen.

2 Notice if the data for any line(s) are grey. (If not, there are no conflicts.)

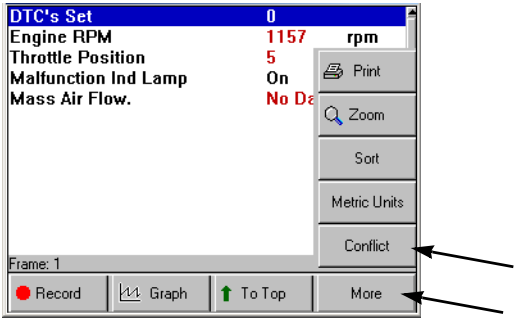


Figure 2.20: More Menu

3 Press the **More** function key.

4 Select **Conflict** and press the **ENTER** key.

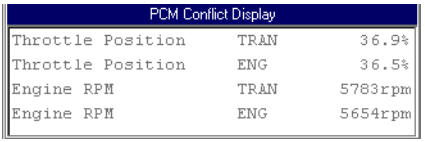


Figure 2.21: PCM Conflict Display Screen

5 The PCM Conflict Display screen lists the conflict item(s), the PCMs reading the item(s), and the readings for each PCM. Be aware of the following:

- If there is a small difference between the readings for an item, the conflict is most likely due to a timing difference of when the PCMs reported the data.
- If there is a large difference between the readings for an item, suspect a broken wire or PCM fault.

6 After viewing the items, use the **EXIT** key to return to previous screens.

Remembered Settings

When you have the Datastream screen displayed for a vehicle and you rearrange the data lines or change lines to graphs, and then exit the Datastream screen, the software automatically remembers the settings the next time you test the same vehicle. This applies to the 20 most-recently tested vehicles.

For example, if you lock certain lines or sort them, the settings will appear the next time you test the vehicle.

DTC-Triggered Recording

The scan tool has an automatic DTC-Triggered Recording function. This function works automatically and does not appear as an option on any menu. If a diagnostic trouble code (fault) occurs while you are testing a vehicle, the scan tool automatically creates a recording for playback and alerts you with a screen message. To replay these recordings, refer to “***Playback***” on page 78.

Diagnostic Codes

The Diagnostics Codes functions let you read, review, and clear diagnostic trouble codes (DTCs) for the selected electronic control module (ECM).

Basic Procedure

1 Follow the instructions in *"Test Startup and Vehicle Connection"* in the ***Quick Start Guide*** to display the Diagnostic Menu screen.

Note: *Make sure the vehicle's ignition key is in the On (Run) position with the engine off.*

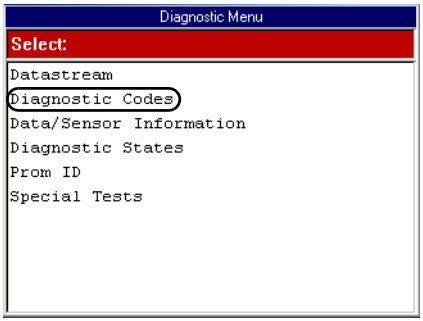


Figure 3.1: Diagnostic Menu Screen

2 Select **Diagnostic Codes** and press the **ENTER** key. This displays the Diagnostic Trouble Codes screen (*Figure 3.2* and *Figure 3.3*).

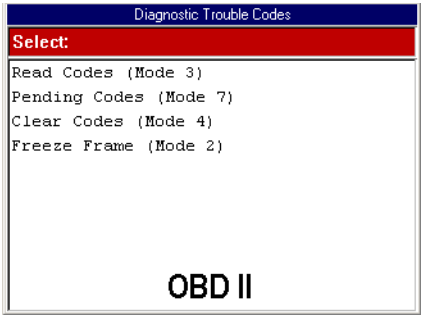


Figure 3.2: Diagnostic Trouble Codes Screen Examples — OBD II and GM / Saturn

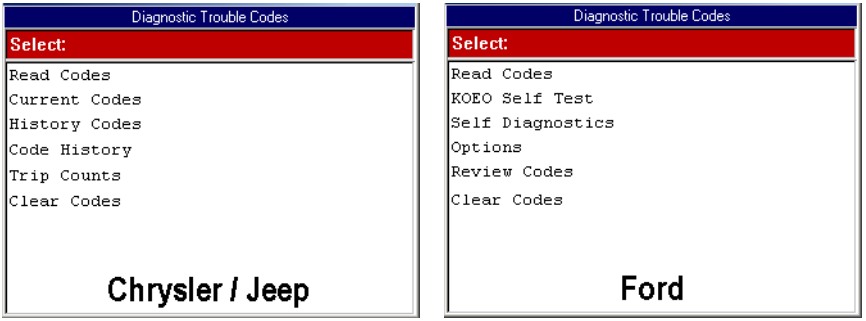


Figure 3.3: Diagnostic Trouble Codes Screen Examples — Chrysler / Jeep and Ford

Note: *The screens shown above are only examples that show all possible options. During testing, only the options available for the vehicle and ECM being tested will appear on this screen.*

3 **Select an option** and press the **ENTER** key to continue.

4 Refer to the following sections:

- "**OBD II Codes**" on page 25
- "**GM / Saturn Codes**" on page 29
- "**Chrysler / Jeep Codes**" on page 35
- "**Ford Codes**" on page 42

OBD II Codes

For OBD II vehicles, the Diagnostic Trouble Codes screen usually has the following menu options. (Refer to the page numbers given for the specific procedures.)

- "**Read Codes / Pending Codes**" (below)
- "**Clear Codes**" on page 27
- "**Freeze Frame**" on page 28

Read Codes / Pending Codes

The Read Codes function lets you view a list of active DTCs along with their descriptions. The Pending Codes function lets you view a list of codes previously set but not currently active.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

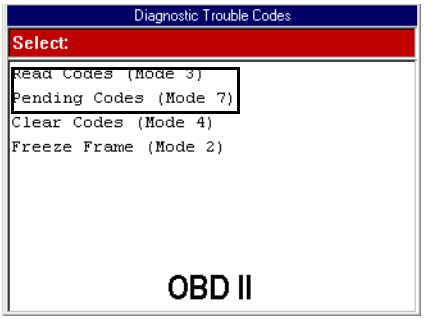


Figure 3.4: OBD II Diagnostic Trouble Codes Screen

Note: *"Modes" are an older method for naming the functions. Refer to the vehicle's manual for more information.*

2 **Select one** of the following and then press the **ENTER** key to display the DTCs:

- **Read Codes —** displays DTCs that have occurred a specified number of times and indicate a problem that requires repair.
- **Pending Codes —** displays DTCs that have occurred at least once, but have not occurred enough times to be considered "Current." (You can use this option to check recent repairs because it shows DTCs after only one drive cycle.)

Read Codes / Pending Codes (continued)

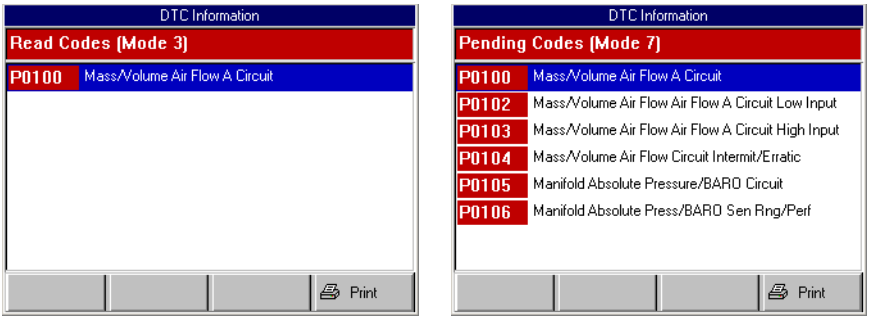

DTC Information
Read Codes (Mode 3)
P0100 Mass/Volume Air Flow A Circuit
Print
DTC Information
Pending Codes (Mode 7)
P0100 Mass/Volume Air Flow A Circuit
P0102 Mass/Volume Air Flow Air Flow A Circuit Low Input
P0103 Mass/Volume Air Flow Air Flow A Circuit High Input
P0104 Mass/Volume Air Flow Circuit Intermit/Erratic
P0105 Manifold Absolute Pressure/BARO Circuit
P0106 Manifold Absolute Press/BARO Sen Rng/Perf
Print

Figure 3.5: OBD II DTC Information Screens: Read Codes and Pending Codes

3 View the DTC list and optionally print it.

4 When finished, use the **EXIT** key to return to previous screens.

Note: *Use the Clear Codes function to erase the codes from a vehicle's ECM. For details, refer to "**Clear Codes**" on page 27.*

Clear Codes

The Clear Codes function lets you clear the DTC codes from the vehicle's ECM.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

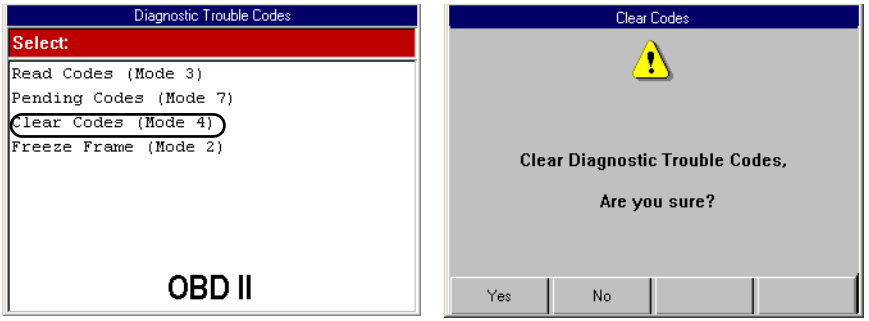


Figure 3.6: OBD II Diagnostic Trouble Codes Screen and Clear Codes Warning Screen

2 Select **Clear Codes** and press the **ENTER** key. This displays a warning screen, shown above.

3 Press the **Yes** function key and follow the instructions on each screen that appears. Press the function keys as necessary until the "DTCs have been cleared" Information screen appears.

Note: *If a screen has no function keys, press the* ***ENTER*** *key to continue.*

4 On the Information screen (not shown), press the **OK** function key.

5 Use the **EXIT** key to return to previous screens.

Freeze Frame

The Freeze Frame function lets you view datastream “snapshots” that were automatically recorded by the ECM when one or more DTCs occurred. By viewing the actual data values from the time of a fault, you may be able to determine what caused the fault.

1 Follow the steps in “**Basic Procedure**” on page 23 to display the Diagnostic Trouble Codes screen.

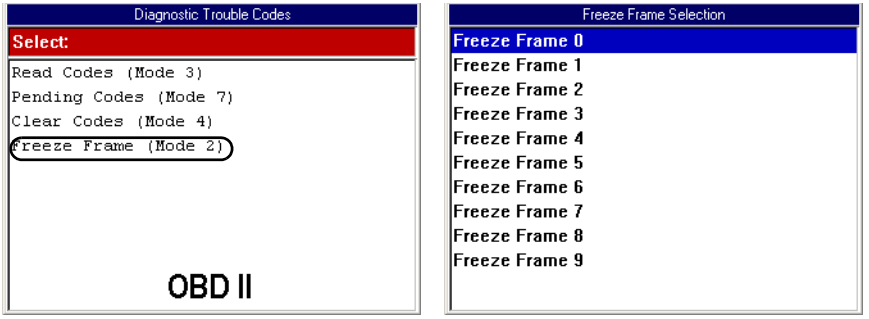


Figure 3.7: OBD II Diagnostic Trouble Codes Screen and Freeze Frame Selection Screen

2 Select **Freeze Frame** and press the **ENTER** key. This displays the Freeze Frame Selection screen, shown above. Each frame contains a snapshot from when a DTC occurred.

3 **Select a Frame** and press the **ENTER** key. This displays the snapshot data, shown below.

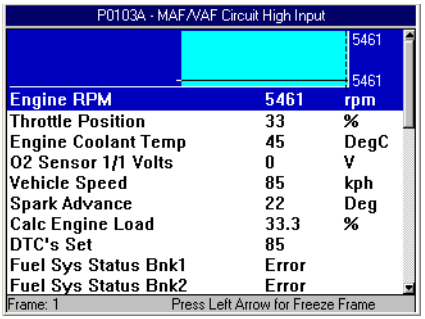

P0103A - MAF/VAF Circuit High Input
5461
5461
Engine RPM 5461 rpm
Throttle Position 33 %
Engine Coolant Temp 45 DegC
O2 Sensor 1/1 Volts 0 V
Vehicle Speed 85 kph
Spark Advance 22 Deg
Calc Engine Load 33.3 %
DTC's Set 85
Fuel Sys Status Bnk1 Error
Fuel Sys Status Bnk2 Error
Frame: 1
Press Left Arrow for Freeze Frame

Figure 3.8: OBD II DTC Freeze Frame Screen

4 Use the **EXIT** key to return to previous screens.

GM / Saturn Codes

For GM and Saturn vehicle ECMs, the Diagnostic Trouble Codes screen usually has the following menu options. (Refer to the page numbers given for the specific procedures.)

- "**Read Codes / Present Codes and Past Codes / History Codes**" (below)
- "**Clear Codes**" on page 34

Note: *The Read Codes option appears most often (along with Clear Codes); the Present, Past, and History Codes appear less frequently (such as for some airbag or brake ECMs).*

Read Codes / Present Codes and Past Codes / History Codes

The Read Codes and Present Codes functions let you view a list of active DTCs for the selected ECM, along with their descriptions. The Past Codes and History Codes functions let you view a list of DTCs that have occurred intermittently.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

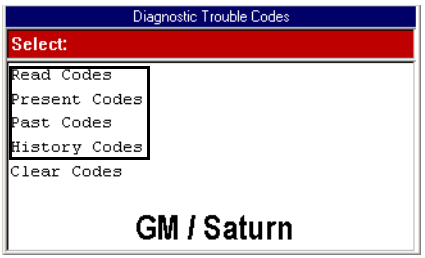


Figure 3.9: GM / Saturn Diagnostic Trouble Codes Screen

2 Select **Read Codes, Present Codes, Past Codes,** or **History Codes** and press the **ENTER** key. One of the following happens:

- If the selected ECM stores only current codes, the DTC Information screen appears (see *Figure 3.11*). Go to step 5 on page 31.
- If the selected ECM stores more than current codes, the Read Codes screen appears (see *Figure 3.10*). Continue with the next step.

Read Codes / Present Codes and Past Codes / History Codes (continued)

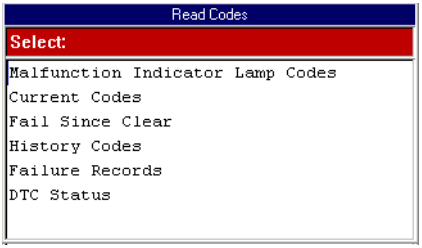


Figure 3.10: GM / Saturn Read Codes Screen

3 **Select one** of the following and then press the **ENTER** key:

- **Malfunction Indicator Lamp —** displays MIL codes, which are DTCs for the check engine light. (This option usually appears for the engine / powertrain ECMs).
- **Current Codes —** displays DTCs that have occurred a specified number of times and indicate a problem that requires repair. (This option appears for most ECMs.)
- **Pending Codes —** displays DTCs that have occurred at least once (during one drive cycle), but have not occurred enough times to be considered "Current." (This option usually appears for anti-lock brakes ECMs.)
- **Fail Since Clear —** displays current and pending DTCs that have occurred since the last time DTCs were cleared from the ECM. (This option usually appears for the engine / powertrain ECMs).
- **History Codes —** displays DTCs that have occurred intermittently and are not currently active. (This option usually appears for the engine / powertrain and airbag ECMs).
- **Failure Records —** displays a list of Failure records so you can view datastream "snapshots" that were automatically recorded by the ECM when one or more DTCs occurred. By viewing the actual data values from the time of a fault, you may be able to determine what caused the fault. (This option usually appears for the engine / powertrain ECMs.)
- **DTC Status —** displays DTCs that have occurred a predetermined number of times so you can view detailed information about each DTC, such as pass or fail this ignition cycle, times failed, and so forth. (This option usually appears for the engine / powertrain ECMs).

Read Codes / Present Codes and Past Codes / History Codes (continued)

4 Do one of the following:

- If you selected Failure Records, the Failure Records Selection screen appears. Go to "**Failure Records**" on page 32 (at the end of this procedure).
- If you selected DTC Status, the GM DTC Status Selection screen appears. Go to "**DTC Status**" on page 33 (at the end of this procedure).
- If you selected any other option, the DTC list appears on the DTC Information screen. Continue with the next step.

  Note: *If there are no DTCs, a message appears to tell you this.*

.

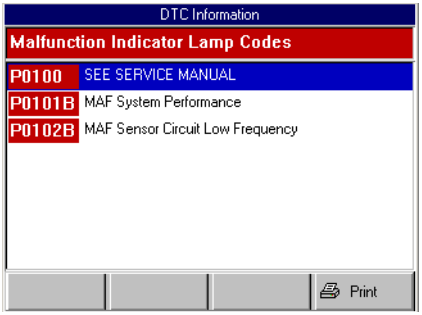


Figure 3.11: GM / Saturn DTC Information Screen

Note: *GM codes are generally listed as A, B, C, or D in order of importance for repair.*

5 View the DTC list and optionally print it.

6 When finished viewing the list, use the **EXIT** key to return to previous screens.

Note: *Use the Clear Codes function to erase the codes from a vehicle's ECM. For details, refer to "**Clear Codes**" on page 34.*

Read Codes / Present Codes and Past Codes / History Codes (continued)

Failure Records

If you selected Failure Records in step 3 of the GM / Saturn Read Codes procedure (page 30), the Failure Records Selection screen appears (shown below). Do the following to view the failure records:

.

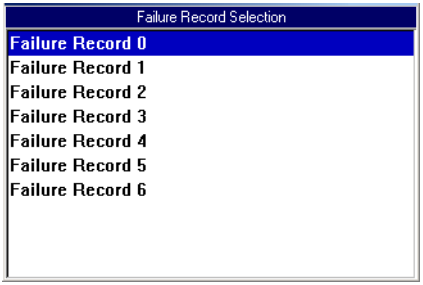


Figure 3.12: GM / Saturn Failure Records Selection Screen

1 Select a **Failure Record** to view and press the **ENTER** key.

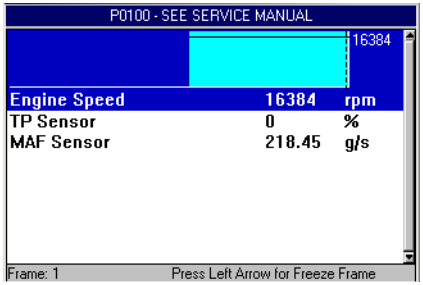


Figure 3.13: GM / Saturn Failure Records Screen

2 When finished, use the **EXIT** key to return to previous screens.

Read Codes / Present Codes and Past Codes / History Codes (continued)

DTC Status

If you selected DTC Status in step 3 of the GM / Saturn Read Codes procedure (page 30), the DTC Status Selection screen appears (shown below). Do the following to view status details for each DTC:

.

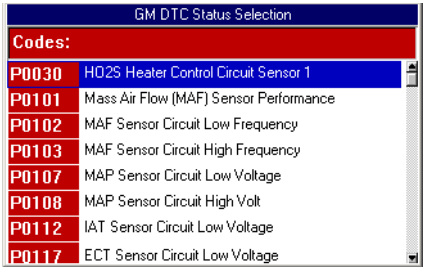

GM DTC Status Selection
Codes:
P0030 HO2S Heater Control Circuit Sensor 1
P0101 Mass Air Flow (MAF) Sensor Performance
P0102 MAF Sensor Circuit Low Frequency
P0103 MAF Sensor Circuit High Frequency
P0107 MAP Sensor Circuit Low Voltage
P0108 MAP Sensor Circuit High Volt
P0112 IAT Sensor Circuit Low Voltage
P0117 ECT Sensor Circuit Low Voltage

Figure 3.14: GM / Saturn DTC Status Selection Screen

1 Select a **DTC** for viewing details and press the **ENTER** key.

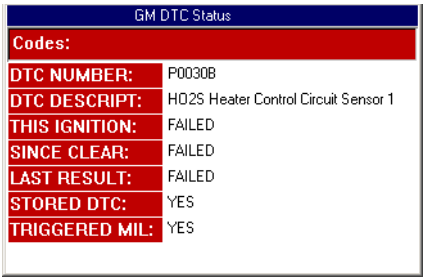


Figure 3.15: GM / Saturn DTC Status Screen

2 When finished viewing the data, use the **EXIT** key to return to previous screens.

Clear Codes

The Clear Codes option lets you clear DTC codes from the selected ECM.

Note: *If Clear Codes is not an available menu option, consult the manufacturer's service manual for the correct "clear code" method.*

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

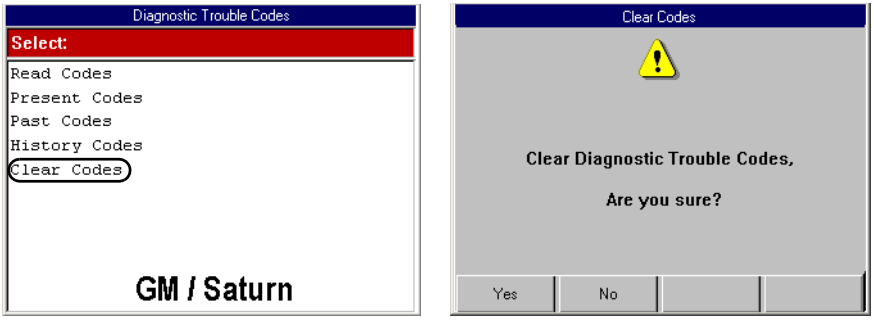


Figure 3.16: GM / Saturn Diagnostic Trouble Codes Screen and Clear Codes Warning Screen

2 Select **Clear Codes** and press the **ENTER** key. This displays a warning screen, shown above.

3 Press the **Yes** function key and follow the instructions on each screen that appears. Press the function keys as necessary until the "DTCs have been cleared" Information screen appears.

Note: *If a screen has no function keys, press the ENTER key to continue.*

4 On the Information screen (not shown), press the **OK** function key.

5 Use the **EXIT** key to return to previous screens.

Note: *GM supplemental inflatable restraint (SIR) code 52, air bag has been deployed, cannot be cleared. All other codes clear and the SIR dash warning light turns off.*

Chrysler / Jeep Codes

For Chrysler and Jeep vehicle ECMs, the Diagnostic Trouble Codes screen can include any of the following menu options.(Refer to the page numbers given for the specific procedures.)

- "**Read Codes / Current Codes and History Codes**" (below)
- "**Code History**" on page 37
- "**Trip Counts**" on page 38
- "**Clear Codes**" on page 39

  Note: *Trip Counts usually appears for transmission ECMs only.*

Read Codes / Current Codes and History Codes

The Read Codes and Current Codes functions let you view a list of active DTCs for the selected ECM, along with their descriptions. The History Codes functions let you view a list of DTCs that have occurred intermittently and are not currently active.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

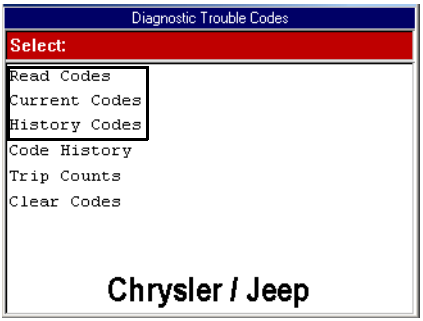


Figure 3.17: Chrysler / Jeep Diagnostic Trouble Codes Screen

2 Select **Read Codes, Current Codes,** or **History Codes** and press the **ENTER** key. A message displays and then the DTC list appears on the DTC Information screen.

Note: *If there are no DTCs, a message appears to tell you this.*

Read Codes / Current Codes and History Codes (continued)

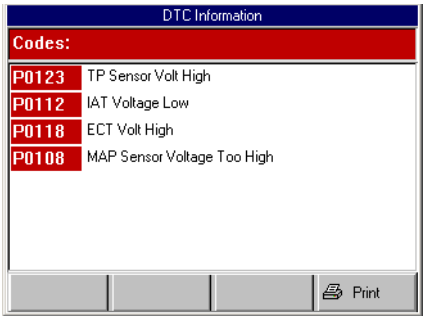


Figure 3.18: Chrysler / Jeep DTC Information Screen

3 View the DTC list and optionally print it.

4 When finished viewing the list, use the **EXIT** key to return to previous screens.

Note: *Use the Clear Codes function to erase the codes from a vehicle's ECM. For details, refer to "**Clear Codes**" on page 39.*

Code History

The Code History function shows how many times the engine has been started since each fault was first detected. From this information, you can determine if a DTC is current or intermittent.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

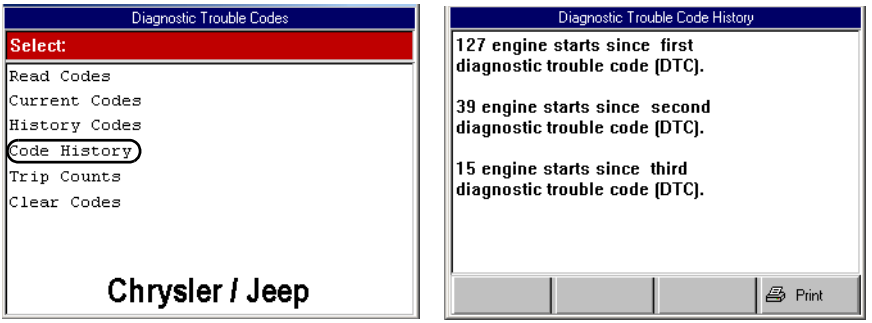


Figure 3.19: Chrysler / Jeep Diagnostic Trouble Codes Screen and Diagnostic Trouble Code History Screen

2 Select **Code History** and press the **ENTER** key. A message displays and then the code history list appears, as shown above.

3 View the list and optionally print it.

4 Be aware of the following:

- The "first" DTC in the list is the oldest.
- The number of engine starts (cycles) is since the code was first detected.
- If engine starts is 1, the DTC occurred during the last ignition cycle and is current.
- If engine starts is 2 or more, the code is present as an intermittent code, but is not current.
- If no codes are found, a number shows how many engine starts have occurred (up to 255 times) since the codes were last cleared.

5 When finished, use the **EXIT** key to return to previous screens.

Trip Counts

The Trip Counts function tells you how many “trips” have occurred since the DTCs were last cleared.

1 Follow the steps in “**Basic Procedure**” on page 23 to display the Diagnostic Trouble Codes screen.

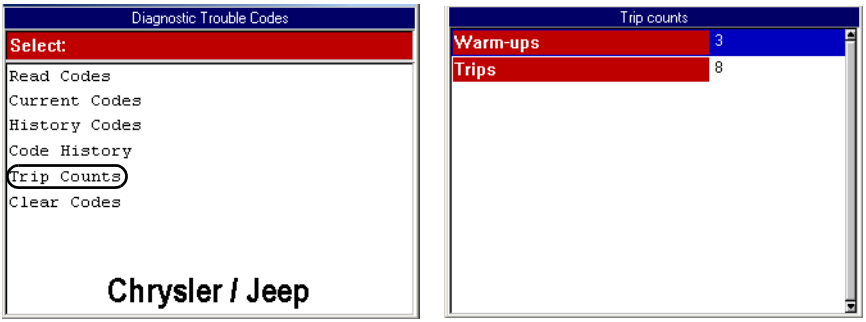


Figure 3.20: Chrysler / Jeep Diagnostic Trouble Codes Screen and Trip Counts Screen

2 Select **Trip Counts** and press the **ENTER** key to display the trip counts, as shown above.

3 Be aware of the following:

- Warm-ups are the number of times the engine has reached operating temperature.
- Trips are the number of times the engine has been warmed-up and driven long enough to meet critical system conditions.

4 When finished, use the **EXIT** key to return to previous screens.

Clear Codes

The Clear Codes option lets you clear DTC codes from the selected ECM. This section includes two separate Clear Codes procedures as follows:

- "**Clear Codes with Scan Tool**" (below)
- "**Clear Codes Manually**" on page 41

Note: *If Clear Codes is not an available menu option, consult the manufacturer's service manual for the correct "clear code" method.*

Clear Codes with Scan Tool

For some vehicles, this Clear Codes function clears the DTCs from the selected ECM.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

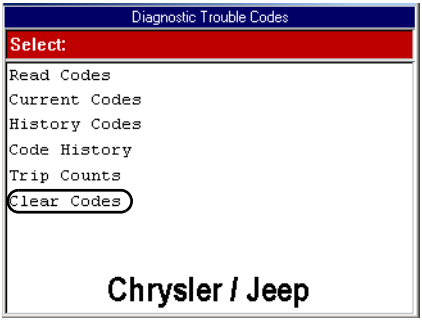
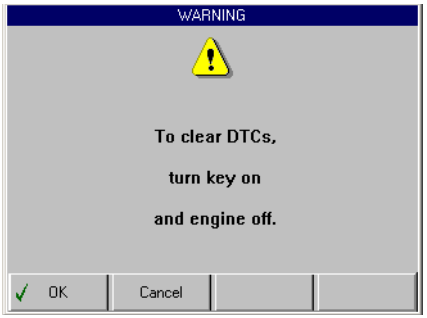


Figure 3.21: Chrysler / Jeep Diagnostic Trouble Codes Screen

2 Select **Clear Codes** and press the **ENTER** key. This displays a warning message with instructions for clearing the DTCs.

Clear Codes (continued)

Clear Codes with Scan Tool (continued)



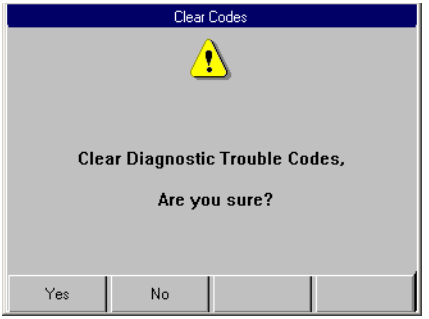


Figure 3.22: Chrysler / Jeep Clear Codes Warning Screens

3 Follow the instructions on each screen that appears. Press the function keys as necessary until the “DTCs have been cleared” Information screen appears.

Note: *If a screen has instructions but no function keys, press the ENTER key to continue.*

Figure 3.23: Chrysler / Jeep DTCs Cleared Information Screen

4 Press the **OK** function key to continue.

5 Use the **EXIT** key to return to previous screens.

Clear Codes (continued)

Clear Codes Manually

For some vehicles, this Clear Codes function displays instructions for how to manually clear DTCs from the selected ECM.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

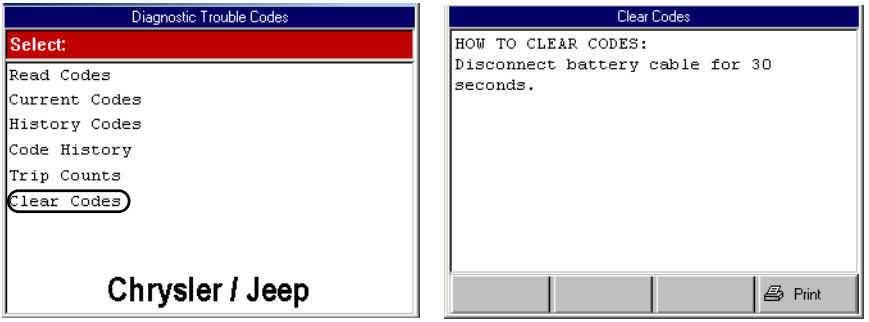


Figure 3.24: Chrysler / Jeep Diagnostic Trouble Codes Screen and Clear Codes Screen

2 Select **Clear Codes** and press the **ENTER** key. This displays instructions for manually clearing the codes, shown above.

3 View the instructions and optionally print them.

4 Use the **EXIT** key to return to previous screens.

Ford Codes

For Ford vehicle ECMs, the Diagnostic Trouble Codes screen can include any of the following menu options. (Refer to the page numbers given for the specific procedures.)

- "**Read Codes**" (below)
- "**KOEO Self Test**" on page 48
- "**Self-Diagnostics**" on page 50
- "**Options**" on page 53 (includes "**Output State**", "**Idle Air Adjust**" and "**Wiggle Test**")
- "**Review Codes**" on page 60
- "**Clear Codes**" on page 62

Read Codes

For Ford vehicles, the Read Codes function varies by vehicle. This section includes three separate Read Codes procedures, as follows:

- **"Read and Display Codes**" on page 43 **—** this procedure reads and displays the DTCs in one procedure. It is generally for most newer vehicles (since 1996).
- "**Read Codes Only**" on page 45 **—** this procedure only reads the DTCs. You use the Review Codes procedure (page 60) to view codes after reading them with this procedure. (It is generally for older Ford vehicles.)
- "**Read Flash Codes**" on page 46 **—** this procedure displays instructions for how to physically view the flash codes from the check engine lamp and then displays a screen for you to enter the codes numbers into the scan tool to see their descriptions. (It is generally for older Ford vehicles.)

Read Codes (continued)

Read and Display Codes

This Read Codes function let you view a list of active DTCs for the selected ECM, along with their descriptions (this usually applies to newer vehicles.)

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen (*Figure 3.25*).

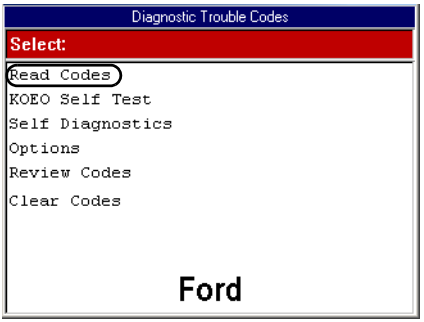


Figure 3.25: Ford Diagnostic Trouble Codes Screen

2 Select **Read Codes** and press the **ENTER** key.

.

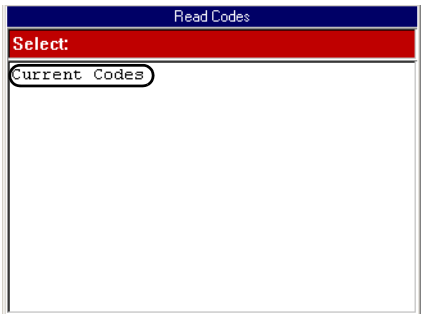


Figure 3.26: Ford Read Codes Screen

3 If the Read Codes screen appears, select **Current Codes** and press the **ENTER** key. Otherwise, skip this step.

A message displays and then the DTC list appears on the DTC Information screen (*Figure 3.27*).

Read Codes (continued)

Read and Display Codes (continued)

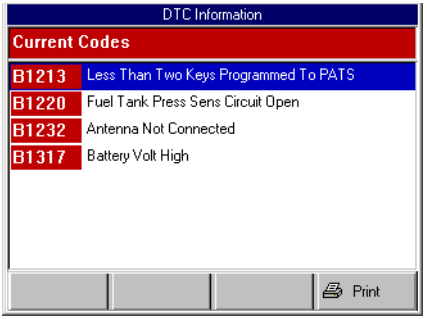


Figure 3.27: Ford DTC Information Screen

4 View the DTC list and optionally print it.

5 When finished viewing the list, use the **EXIT** key to return to previous screens.

Note: *Use the Clear Codes function to erase the codes from a vehicle's ECM. For details, refer to "**Clear Codes**" on page 62.*

Read Codes (continued)

Read Codes Only

This Read Codes function let you view a list of active DTCs, without descriptions, for the selected ECM**.**

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

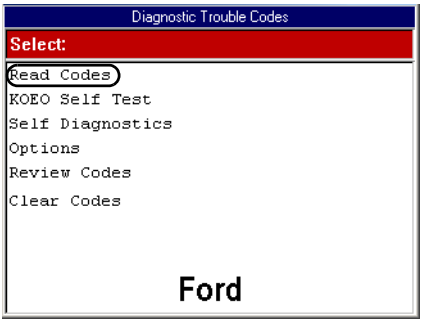


Figure 3.28: Ford Diagnostic Trouble Codes Screen

2 Select **Read Codes** and press the **ENTER** key.

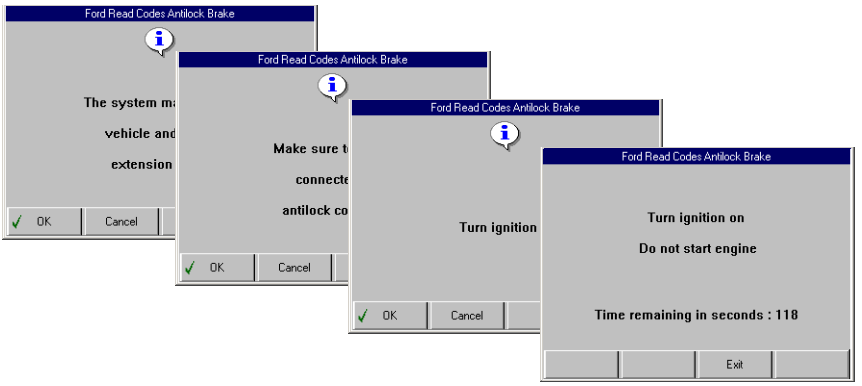


Figure 3.29: Information or Instruction Screens

3 Several instruction screens appear. Read the screens and follow all instructions. If necessary, use the **function keys** to answer any questions.

Read Codes (continued)

Read Flash Codes

This Read Codes function provides instructions for how to: 1) physically view the flash codes from the vehicle and 2) enter the code numbers into the scan tool to see their descriptions (this usually applies to older vehicles).

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

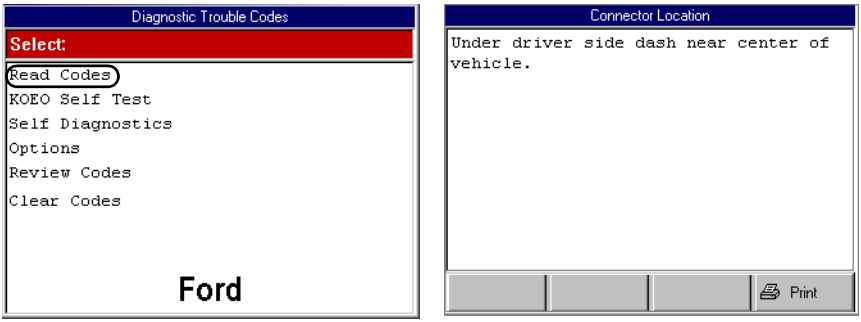


Figure 3.30: Ford Diagnostic Trouble Codes Screen and Connector Location Screen

2 Select **Read Codes** and press the **ENTER** key. This displays the Connector Location screen, shown above.

Note: *If this screen does not appear, go to step 5.*

3 View the information and optionally print it.

4 Press the **ENTER** key to continue. This displays the retrieval procedure.

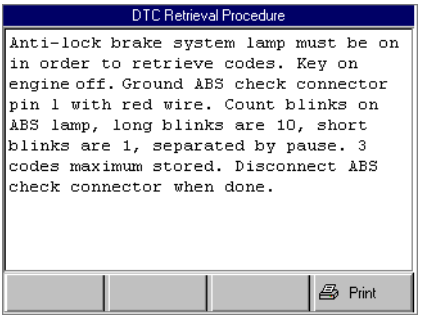

DTC Retrieval Procedure
Anti-lock brake system lamp must be on in order to retrieve codes. Key on engine off. Ground ABS check connector pin 1 with red wire. Count blinks on ABS lamp, long blinks are 10, short blinks are 1, separated by pause. 3 codes maximum stored. Disconnect ABS check connector when done.
Print

Figure 3.31: DTC Retrieval Procedure Screen

Read Codes (continued)

Read Flash Codes (continued)

5 View the retrieval procedure and optionally print it.

6 Use the connector location and DTC retrieval procedure to read the flash codes from the vehicle. When you know the codes, press the **ENTER** key. This displays the Possible Codes screen.

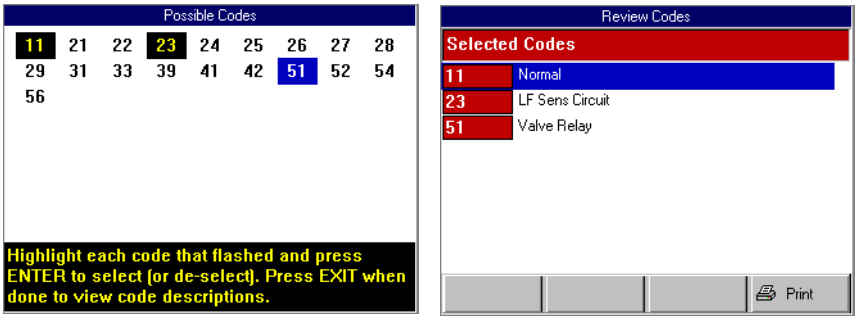

Possible Codes
11 21 22 23 24 25 26 27 28
29 31 33 39 41 42 51 52 54
56
Highlight each code that flashed and press ENTER to select (or de-select). Press EXIT when done to view code descriptions.
Review Codes
Selected Codes
11 Normal
23 LF Sens Circuit
51 Valve Relay
Print

Figure 3.32: Possible Codes Screen and Review Codes Screen

7 Use the Possible Codes screen to enter the flash codes as follows:

- **a** Use the **Arrow** keys to select (highlight) a code number.
- **b** With the number selected, press the **ENTER** key.
- **c** **Repeat steps a and b** until all the flash codes are highlighted.
- **d** Press the **EXIT** key to display the code descriptions on the Review Codes screen, shown above.

8 View the list and optionally print it.

9 Press the **EXIT** key to return to the Diagnostic Menu screen.

10 To clear the codes, refer to "**Clear Flash Codes Manually**" on page 64.

KOEO Self Test

The KOEO Self Test is a key-on, engine-off, DTC-reading function that lets you read MECS slow codes, without descriptions, for the selected ECM.

Note: *This test may require special cables and adapters. Refer to "**Appendix A: Accessory Components**" on page 89.*

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

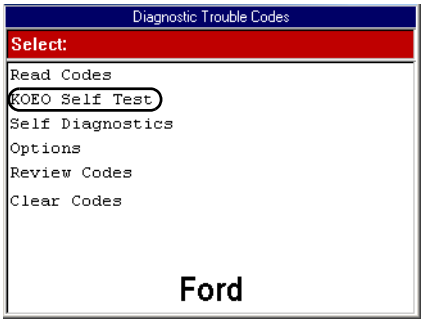


Figure 3.33: Ford Diagnostic Trouble Codes Screen

2 Select **KOEO Self Test** and press the **ENTER** key. Several instruction screens appear.

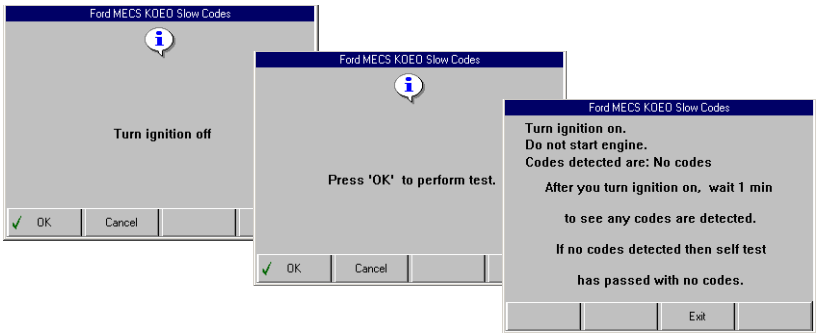


Figure 3.34: Information or Instruction Screens

KOEO Self Test (continued)

3 Read the screens and follow all instructions. If necessary, use the **function keys** to answer any questions. Do this until the “Test completed” screen appears.

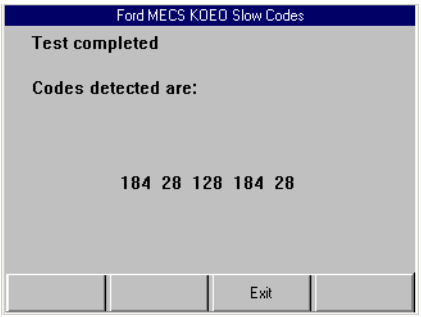


Figure 3.35: Read Codes Test Screen

4 Press the **Exit** function key.

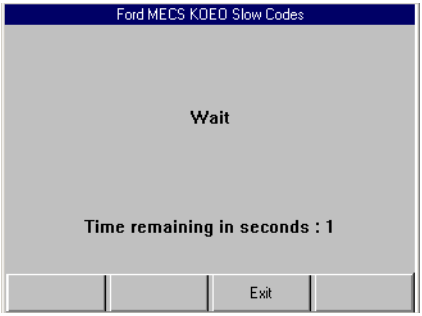


Figure 3.36: Read Codes Instruction Screen

5 Wait for the Diagnostic Menu screen to appear.

Note: *Use the Review Codes function to view a list of any codes that were read. For details, refer to “**Review Codes**” on page 60.*

Self-Diagnostics

The Self-Diagnostic function lets you manually activate system tests that check for DTCs. The tests usually include a key-on, engine off (KOEO) test and a key-on, engine-running (KOER) test.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

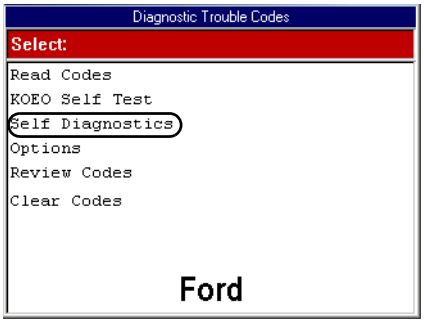


Figure 3.37: Ford Diagnostic Trouble Codes Screen

2 Select **Self Diagnostics** and press the **ENTER** key.

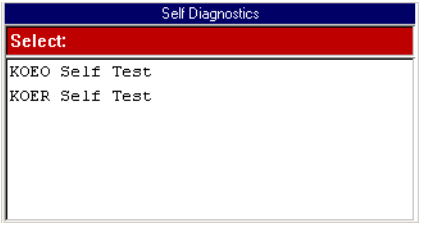


Figure 3.38: Self Diagnostics Screen

3 Select **KOEO Self Test** or **KOER Self Test** and press the **ENTER** key. This displays a test instruction screen (*Figure 3.39*).

Self-Diagnostics (continued)

Figure 3.39: KOEO and KOER Self Test Instruction Screens

4 Follow the instructions on the screen and press the **OK** function key to start the test.

WARNING:

Maintain adequate clearance around moving components or belts during testing. Moving components and belts can catch loose clothing, body parts, or test equipment and cause serious damage or personal injury.

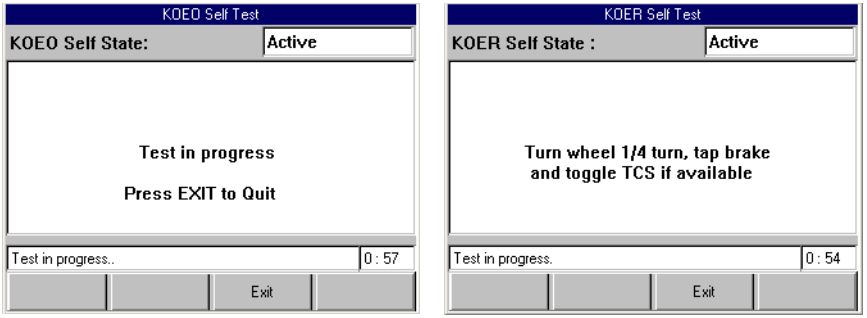


Figure 3.40: KOEO an KOER Self Test Screens

5 Wait for the test to start. While the test runs, the State (of the actuators) remains active, any special instructions appear on the screen, and a timer counts down the time remaining for the test.

Self-Diagnostics (continued)

6 Follow any instructions that appear on the screen and wait for the test to complete. When the test is complete, the list of DTCs appears on the DTC Information screen.

Note: *If the DTC list does not appear after 15 seconds, press the EXIT key and start the test again.*

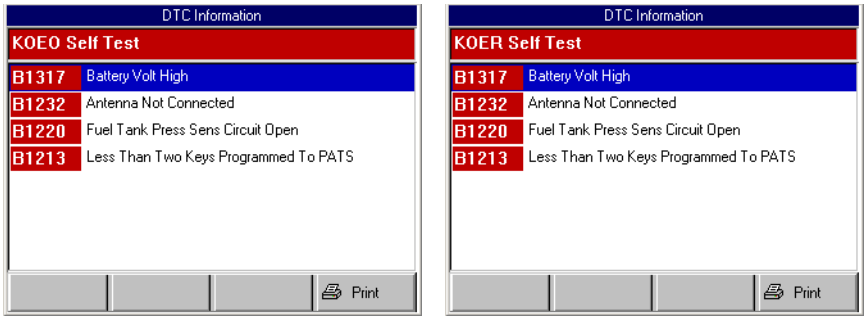

DTC Information
KOEO Self Test
B1317 Battery Volt High
B1232 Antenna Not Connected
B1220 Fuel Tank Press Sens Circuit Open
B1213 Less Than Two Keys Programmed To PATS
Print
DTC Information
KOER Self Test
B1317 Battery Volt High
B1232 Antenna Not Connected
B1220 Fuel Tank Press Sens Circuit Open
B1213 Less Than Two Keys Programmed To PATS
Print

Figure 3.41: KOEO an KOER Self Test — DTC Information Screens

Note: *The KOEO DTC list includes previous codes stored in the ECM (Current Codes or Keep Alive Codes) and codes detected at the time of the test (On-Demand Codes or Hard Fault Codes).*

7 View the DTC list and optionally print it.

8 When finished viewing the list, use the **EXIT** key to return to previous screens.

Note: *Use the Review Codes option to view the codes again; refer to "**Review Codes**" on page 60. To clear the codes, refer to "**Clear Codes**" on page 62.*

Options

The Options function lets you test the function of the output relays and lets you do a "wiggle" test to check for intermittent breaks in circuitry. This section includes the following procedures:

- "**Output State**" (below)
- "**Idle Air Adjust**" on page 56
- "**Wiggle Test**" on page 57

Output State

The Output State test does a KOEO self test (see page 48) and then lets you test the state of the output relays by pressing and releasing the vehicle's accelerator pedal.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

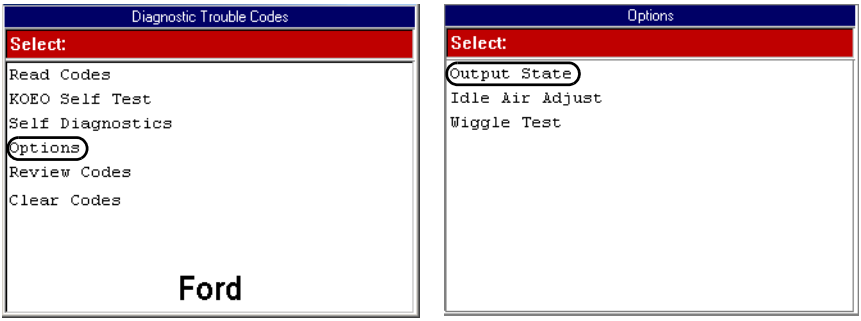


Figure 3.42: Ford Diagnostic Trouble Codes Screen and Options Screen

2 Select **Options** and press the **ENTER** key. This displays the Options screen, shown above.

3 Select **Output State** and press the **ENTER** key. This displays an instruction screen.

Options (continued)

Output State (continued)

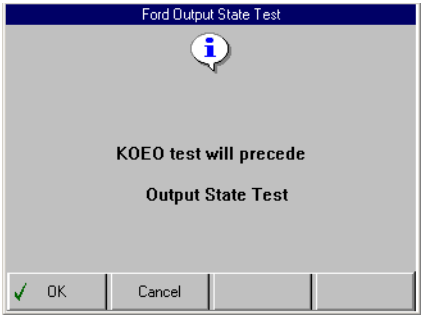


Figure 3.43: Output State Test Instruction Screen

4 Press the **OK** function key to start the KOEO Self Test. Several instruction screens appear.

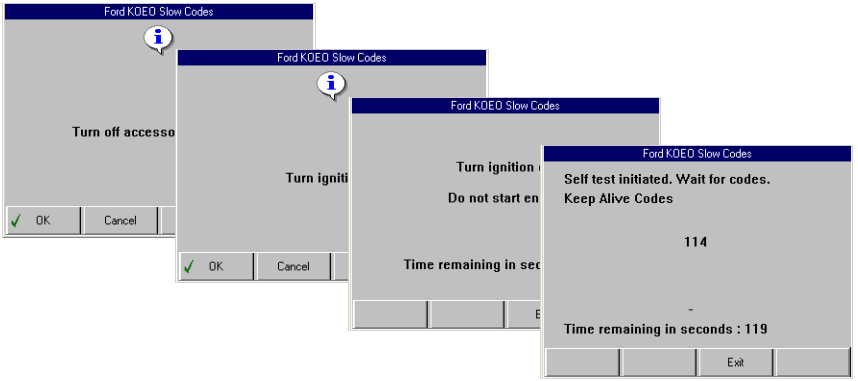


Figure 3.44: KOEO Self Test Instruction Screens

5 Read the screens and follow all instructions. If necessary, use the **function** keys to answer any questions. Do this until the “Test completed” screen appears.

Options (continued)

Output State (continued)

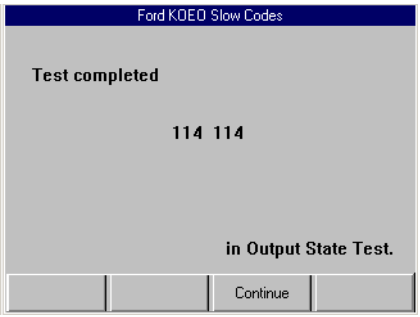
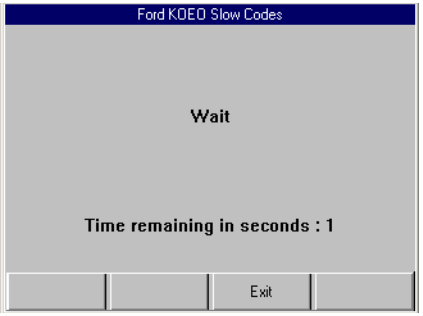


Figure 3.45: KOEO Self Test Completed Screen

6 Note any DTCs listed and press the **Continue** function key. This displays another instruction screen and then displays the Output Test State screen.



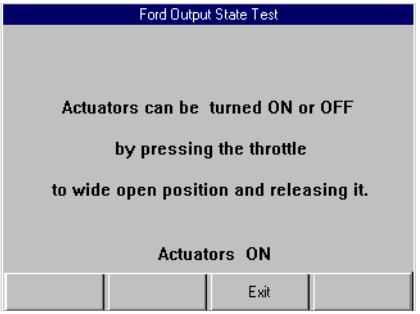

Ford Output State Test
Actuators can be turned ON or OFF
by pressing the throttle
to wide open position and releasing it.
Actuators ON
Exit

Figure 3.46: KOEO Self Test (Slow Codes) Instruction Screen and Output State Test Screen

7 Follow the instructions on the test screen. Compare the actual throttle position to the Actuators state shown on the screen.

Note: *This test may automatically exit after 10 minutes.*

8 When finished, press the **Exit** function key to complete the test.

9 Use the **EXIT** key to return to previous screens.

Note: *Use the Review Codes option to view the codes again; refer to "**Review Codes**" on page 60. To clear the codes, refer to "**Clear Codes**" on page 62.*

Options (continued)

Idle Air Adjust

The Idle Air Adjust function checks the status of the base idle RPM.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

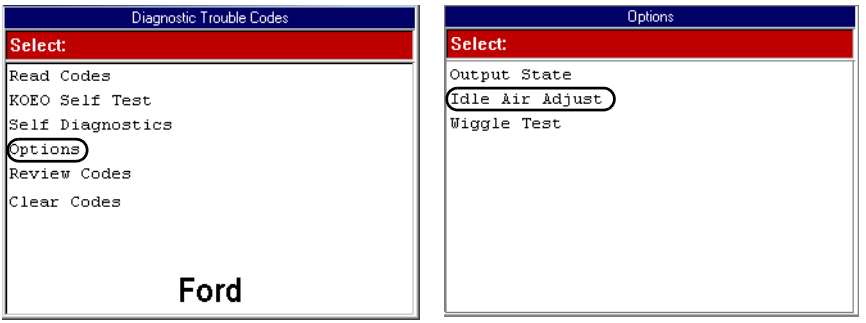


Figure 3.47: Ford Diagnostic Trouble Codes Screen and Options Screen

2 Select **Options** and press the **ENTER** key. This displays the Options screen, shown above.

3 Select **Idle Air Adjust** and press the **ENTER** key.

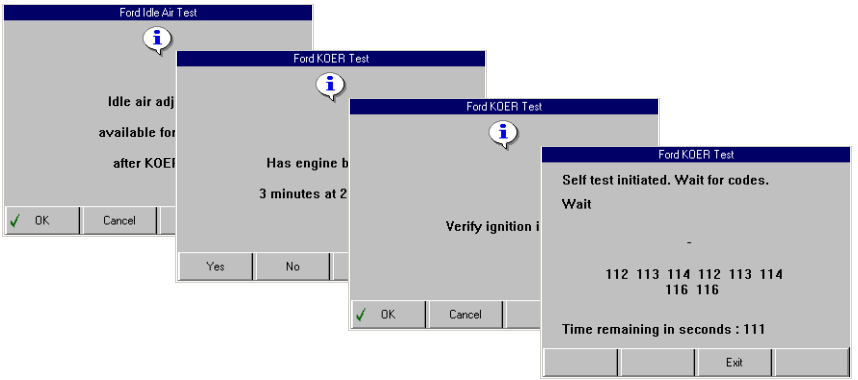


Figure 3.48: Idle Air Test Instruction Screens (KOER Test)

4 Several instruction screens appear. Read the screens and follow all instructions. If necessary, use the **function keys** to answer any questions.

Note: *Use the Review Codes option to view the codes again; refer to "**Review Codes**" on page 60. To clear the codes, refer to "**Clear Codes**" on page 62.*

Options (continued)

Wiggle Test

The Wiggle Test function lets you check for intermittent breaks in connections and for open or short circuits by manually wiggling vehicle wires.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

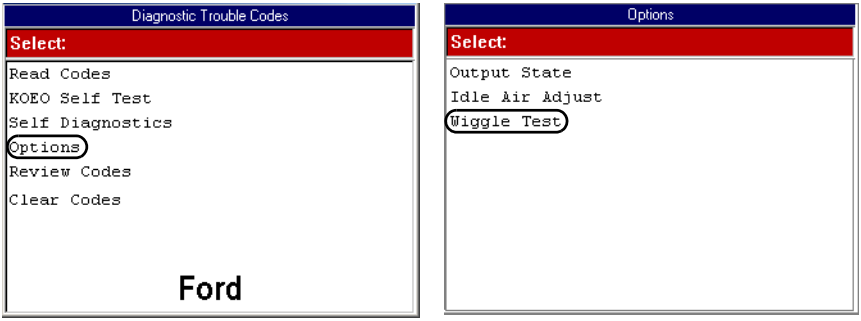


Figure 3.49: Ford Diagnostic Trouble Codes Screen and Options Screen

2 Select **Options** and press the **ENTER** key. This displays the Options screen, shown above.

3 Select **Wiggle Test** and press the **ENTER** key.

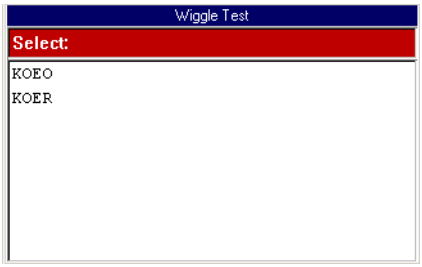


Figure 3.50: Wiggle Test Select Screen

4 Select either **KOEO** or **KOER** to do the test with the key on and the engine either off (KOEO) or running (KOER).

5 If you select KOER, start the vehicle's engine.

6 Press the **ENTER** key. This displays an instruction screen (*Figure 3.51* on page 58).

Options (continued)

Wiggle Test (continued)

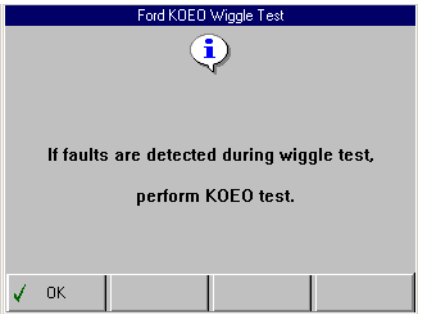


Figure 3.51: Wiggle Test Instruction Screen

7 Press the **OK** function key to continue. Several instruction screens appear.

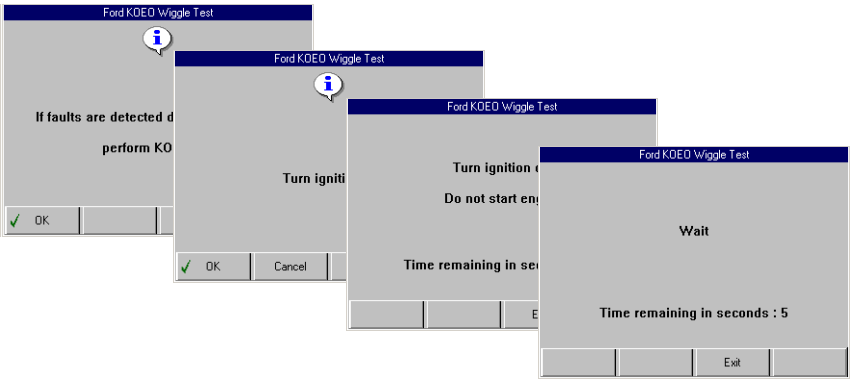


Figure 3.52: Wiggle Test Instruction Screens

8 Read the screens and follow all instructions. If necessary, use the **function keys** to answer any questions. Do this until the test screen appears (*Figure 3.53* on page 59).

Options (continued)

Wiggle Test (continued)

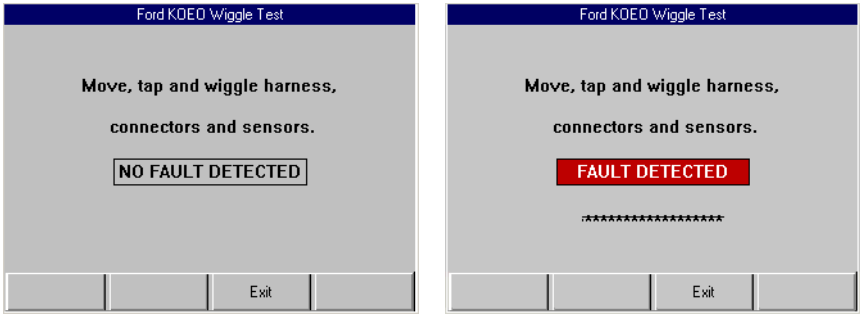


Figure 3.53: Wiggle Test Screens — No Fault and Fault Detected

9 With the test screen displayed, manually wiggle the vehicle wires and connections or drive the vehicle to recreate a suspected intermittent failure condition. If a fault is detected, the message “FAULT DETECTED” appears on the screen, as shown above.

⚠ WARNING:

Maintain adequate clearance around moving components or belts during testing. Moving components and belts can catch loose clothing, body parts, or test equipment and cause serious damage or personal injury.

---

10 When finished, press the **Exit** function key to complete the test.

11 Use the **EXIT** key to return to previous screens.

Note: *When finished, do a KOEO test (see “**Self-Diagnostics**” on page 50).*

Review Codes

The Review Codes function lets you view DTCs read from the selected ECM. This function displays DTCs only after you have used a function that reads codes, such as Read Codes, KOEO Self-Test, Self-Diagnostics, Output State Test, and Wiggle Test.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

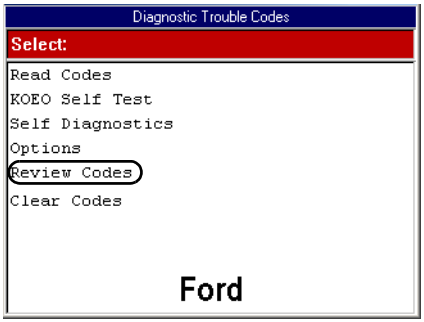


Figure 3.54: Ford Diagnostic Trouble Codes Screen

2 Select **Review Codes** and press the **ENTER** key.

Figure 3.55: Review Codes Select Screen

Review Codes (continued)

3 If the Review Codes Select screen appears (*Figure 3.55* on page 60), select one of the following options, and then press the **ENTER** key to display the codes. (Otherwise, skip this step.)

- **KOEO on Demand —** displays DTCs detected at the time of a KOEO test (also called hard fault codes).
- **KOEO Keep Alive —** displays DTCs stored in the ECM before a KOEO test (also called current codes).
- **KOER —** displays codes from a KOER test.

Note: *If there are no codes to display, a message screen states that the code library is empty. Press the OK function key to continue.*

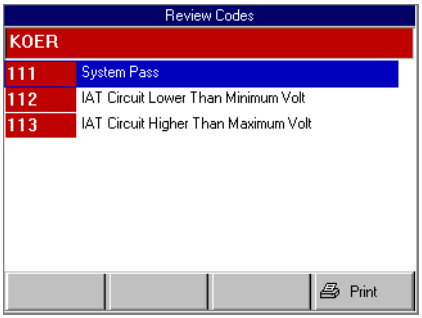


Figure 3.56: Review Codes Screen

4 View the list and optionally print it.

5 Use the **EXIT** key to return to previous screens.

Note: *After reviewing the codes, if necessary, clear the codes. Use any instructions that were provided when reading the codes and refer to "**Clear Codes**" on page 62. If necessary, consult the manufacturer's service manual for the correct "clear code" method.*

Clear Codes

The Clear Codes option lets you clear DTC codes from the selected ECM. This section includes two separate Clear Codes procedures as follows:

- "**Clear Codes with Scan Tool**" (below)
- "**Clear Flash Codes Manually**" on page 64

Note: *If Clear Codes is not an available menu option, consult the manufacturer's service manual for the correct "clear code" method.*

Clear Codes with Scan Tool

For some vehicles, this Clear Codes function clears the DTCs from the selected ECM or provides instructions for how to clear the codes from the ECM.

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

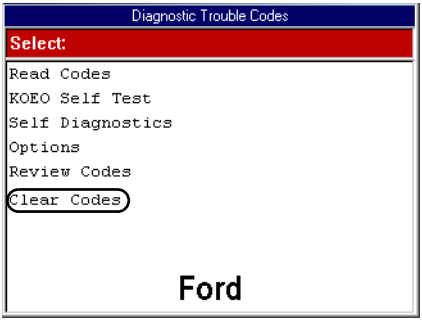


Figure 3.57: Ford Diagnostic Trouble Codes Screen

2 Select **Clear Codes** and press the **ENTER** key. This displays either an instruction screen or a warning screen (*Figure 3.58* on page 63).

Clear Codes (continued)

Clear Codes with Scan Tool (continued)

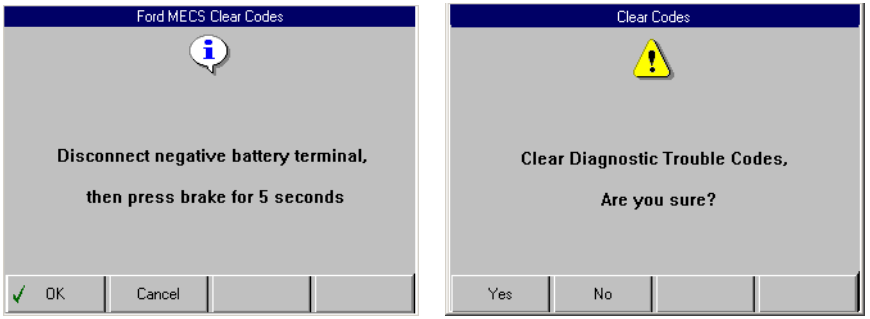


Figure 3.58: Ford Clear Codes Instruction Screen and Warning Screen

3 Press the appropriate **function key**.

4 One or more additional instruction screens may appear. If so, follow the instructions on each screen. Press the **function keys** as necessary until the DTCs have been cleared.

Note: *If a screen has instructions but no function keys, press the ENTER key to continue.*

5 When finished, use the **EXIT** key to return to previous screens.

Clear Codes (continued)

Clear Flash Codes Manually

For some vehicles, this Clear Codes function displays instructions for how to manually clear flash codes from the selected ECM.

Note: *If necessary, consult the manufacturer's service manual for the correct "clear code" method.*

1 Follow the steps in "**Basic Procedure**" on page 23 to display the Diagnostic Trouble Codes screen.

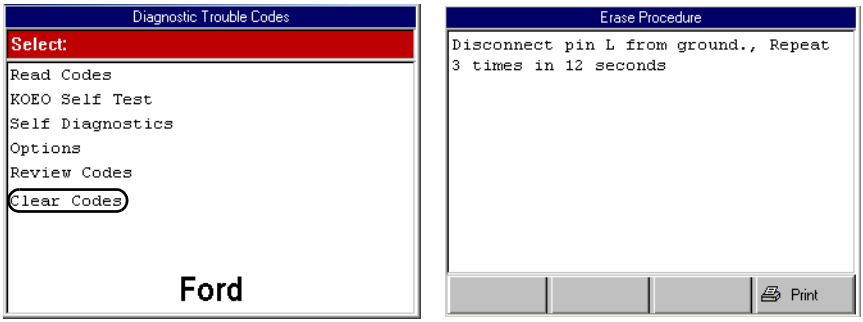


Figure 3.59: Ford Diagnostic Trouble Codes Screen and Erase Procedure Screen

2 Select **Clear Codes** and press the **ENTER** key. This displays instructions for manually clearing the codes, as shown above.

3 View the instructions and optionally print them.

4 Use the **EXIT** key to return to previous screens.

5 Use the erase procedure to manually clear the flash codes from the vehicle.

Data / Sensor Information

The Data Info function displays a list of the vehicle's engine sensors and switches that are available for the selected electronic control module (ECM). With the list displayed, you can individually select each item and view information about it, such as a description, a current reading from the vehicle (if the vehicle is connected), and information about typical values for the sensor or switch.

Note: *You can use this procedure to access the Data / Sensor Information function or you can access it with the More function key on the live Datastream screen. For the Datastream procedures, refer to "**Data Info**" on page 14.*

1 Follow the instructions in *"Test Startup and Vehicle Connection"* in the ***Quick Start Guide*** to display the Diagnostic Menu screen.

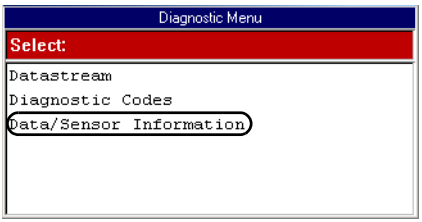


Figure 4.1: Diagnostic Menu Screen

2 Select **Data / Sensor Information** and press the **ENTER** key.

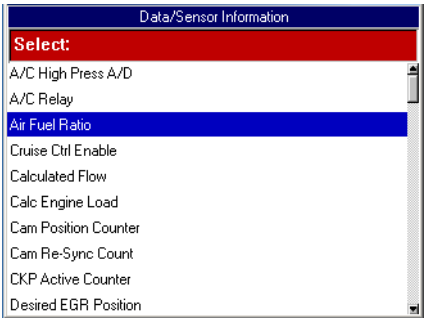


Figure 4.2: Data / Sensor Information Screen

3 **Select an item** and press the **ENTER** key.

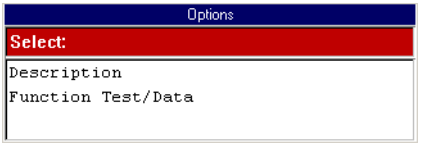


Figure 4.3: Options Screen

4 Select an option as follows:

- Select **Description** to view a description of the selected sensor or switch.
- Select **Function Test / Data** to view the typical value or other information about the selected sensor or switch.

  Note: *The scan tool and vehicle do not have to be connected to view the description or typical values for a sensor or switch. The vehicle does have to be connected to view actual readings.*

This displays either the Description screen or the Function Test / Data screen.

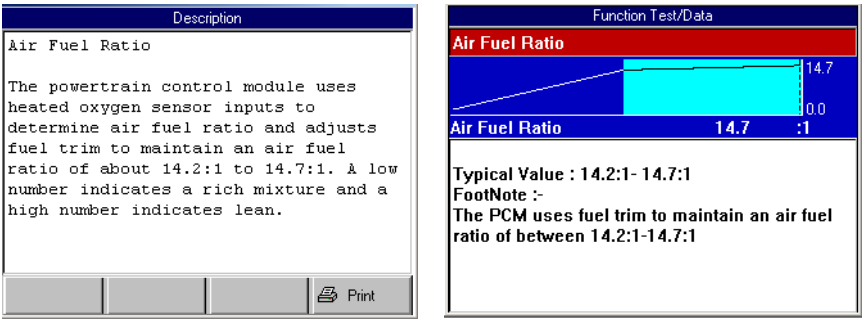

Description
Air Fuel Ratio
The powertrain control module uses heated oxygen sensor inputs to determine air fuel ratio and adjusts fuel trim to maintain an air fuel ratio of about 14.2:1 to 14.7:1. A low number indicates a rich mixture and a high number indicates lean.
Print
Function Test/Data
Air Fuel Ratio
14.7
0.0
Air Fuel Ratio 14.7 :1
Typical Value : 14.2:1- 14.7:1
FootNote :-
The PCM uses fuel trim to maintain an air fuel ratio of between 14.2:1-14.7:1

Figure 4.4: Description Screen and Function Test / Data Screen

5 View the information (and optionally print the description).

6 Use the **EXIT** key to return to previous screens.

Diagnostic States (GM)

For some older GM vehicle engine ECMs, the Diagnostic States function lets you place a vehicle in special test modes (states). The Road Mode is normally used for diagnostic testing and three additional modes are available to check codes, serve as a backup fuel setting, or function as a service setting as follows:

- **Road Mode —** should be used whenever possible to diagnose driveability problems. This mode does not include a preset test idle speed or additional advance.
- **Field Service Mode —** grounds the vehicle diagnostic link and triggers the check engine indicator light to flash. From the number and speed of the flashes, you can determine DTCs and the current state of the Oxygen (O2) sensor.
- **Back-Up Fuel Mode** (also called limp-in mode) **—** keeps a disabled vehicle running until it can be repaired. This mode supplies injector pulses to the fuel injectors and sets base timing if the Programmable Read Only Memory (PROM) chip fails. Vehicle service manuals refer to this mode as “3.9 K Ohm State” or “Factory Test State.” (You cannot view sensor or switch data in this mode.)
- **ALCL Mode —** automatically sets a test idle speed and additional ignition advance if Road Test data is unavailable or unreliable. Vehicle service manuals refer to this mode as “10 K Ohm State” or “Special State.”

1 Follow the instructions in *"Test Startup and Vehicle Connection"* in the ***Quick Start Guide*** to display the Diagnostic Menu screen.

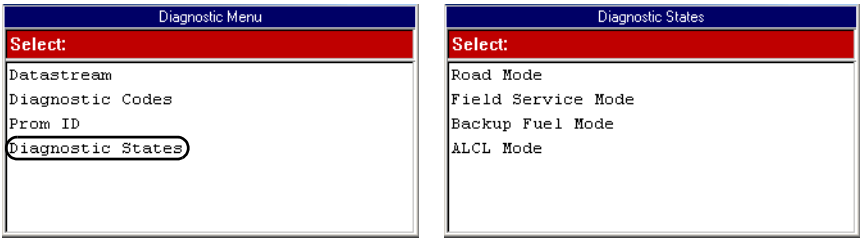


Figure 5.1: Diagnostic Menu Screen and Diagnostic States Screen

2 Select **Diagnostic States** and press the **ENTER** key to display the Diagnostic States screen, as shown above.

3 Select a **Mode** and press the **ENTER** key.

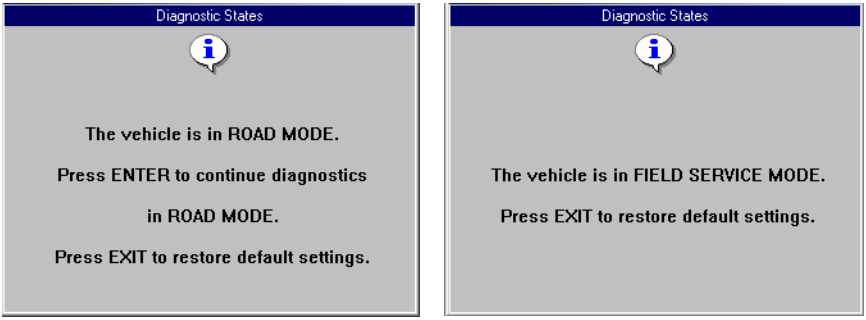

Diagnostic States
The vehicle is in ROAD MODE.
Press ENTER to continue diagnostics
in ROAD MODE.
Press EXIT to restore default settings.
Diagnostic States
The vehicle is in FIELD SERVICE MODE.
Press EXIT to restore default settings.

Figure 5.2: Diagnostic States Screens (Road Mode and Field Service Mode)

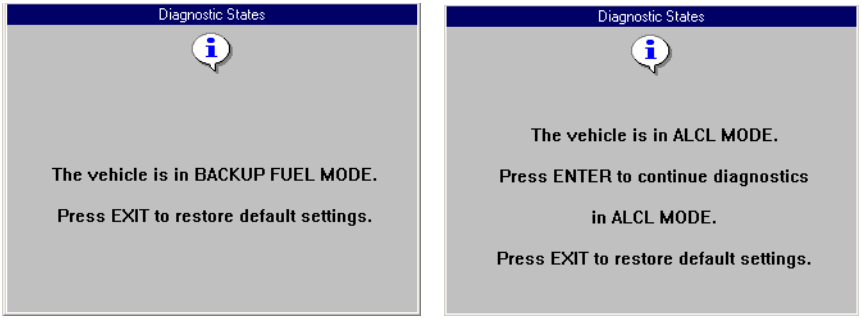

Diagnostic States
The vehicle is in BACKUP FUEL MODE.
Press EXIT to restore default settings.
Diagnostic States
The vehicle is in ALCL MODE.
Press ENTER to continue diagnostics
in ALCL MODE.
Press EXIT to restore default settings.

Figure 5.3: Diagnostic States Screens (Backup Fuel Mode and ALCL Mode)

4 Press the **ENTER** key to set the mode.

5 Perform the necessary diagnostic tests.

6 If you select Field Service Mode, do the following to read the DTCs and the Oxygen (O2) sensor state:

- To read **DTCs**, turn the vehicle key on (engine off) and consult the vehicle service manual to interpret the light flashes.
- To read the **oxygen (O2) sensor state**, start the engine and count how many times the check engine light flashes per second (one or two) and notice if the light is on longer than it is off, or vice versa. Interpret the flashes as follows: one flash per second indicates closed loop and two flashes per second indicates open loop; light on longer than off indicates rich running engine; light off longer than on indicates lean running engine; light on and off equal times indicates ideal running engine (14.7 to 1 air/fuel ratio).

PROM ID (GM)

For some GM vehicles, the Programmable Read-Only Memory Identification (PROM ID) function displays the PROM ID number and any additional PROM related information that is stored in the selected electronic control module (ECM).

1 Follow the instructions in *"Test Startup and Vehicle Connection"* in the ***Quick Start Guide*** to display the Diagnostic Menu screen.

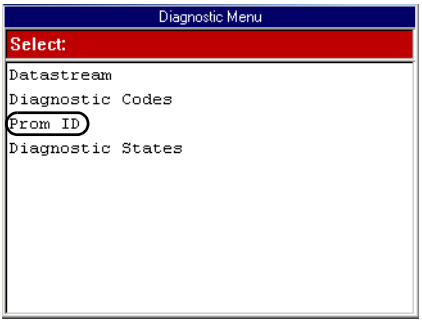


Figure 6.1: Diagnostic Menu Screen

2 Select **Prom ID** and press the **ENTER** key.

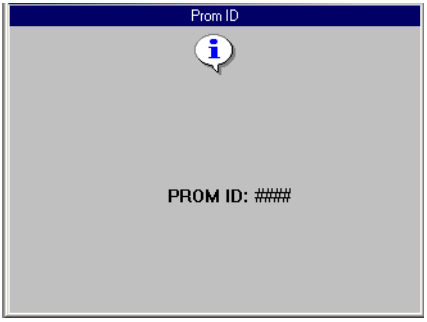


Figure 6.2: Prom ID Screen

3 View the information.

4 Use the **EXIT** key to return to previous screens.

Special Tests (OBD II)

For OBD II compliant vehicles, the Special Tests functions let you view detailed system component information, oxygen (O2) sensor readings, Readiness Test results, and the vehicle identification number (VIN).

Note: *The scan tool has an automatic DTC-Triggered Recording function. If a diagnostic trouble code (fault) occurs while you are testing a vehicle, the scan tool automatically creates a recording for playback and alerts you with a screen message. To replay these recordings, refer to "**Playback**" on page 78.*

Basic Procedure

1 Follow the instructions in *"Test Startup and Vehicle Connection"* in the ***Quick Start Guide*** to display the Diagnostic Menu screen.

Note: *You must select Global OBD II for testing.*

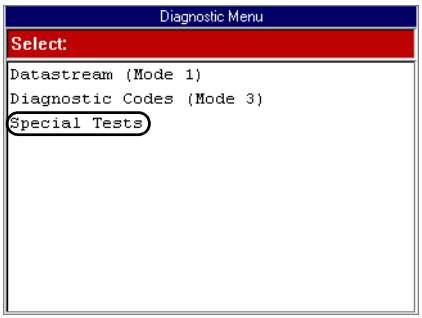


Figure 7.1: Diagnostic Menu Screen

2 Select **Special Tests** and press the **ENTER** key. This displays the Special Tests Menu screen (*Figure 7.2*).

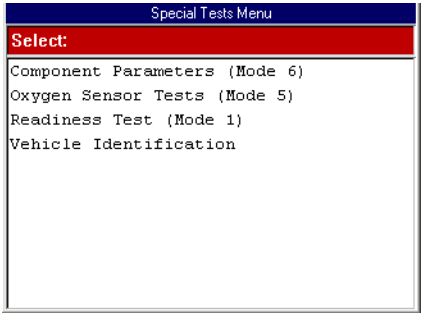


Figure 7.2: Special Tests Menu Screen

3 **Select an option** and press the **ENTER** key to continue.

4 Refer to the following sections:

- "**Component Parameters**" on page 72
- "**Oxygen Sensor Tests**" on page 74
- "**Readiness Test**" on page 76
- "**Vehicle Identification**" on page 77

Component Parameters

The Component Parameters function lets you view detailed information about components that are not continuously monitored, such as a catalyst or evaporative system.

1 Follow the steps in "**Basic Procedure**" on page 70 to display the Special Tests Menu screen.

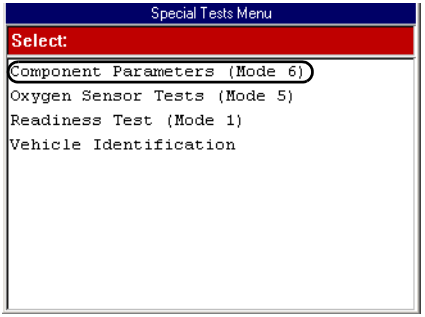


Figure 7.3: Special Tests Menu Screen

2 Select **Component Parameters** and press the **ENTER** key.

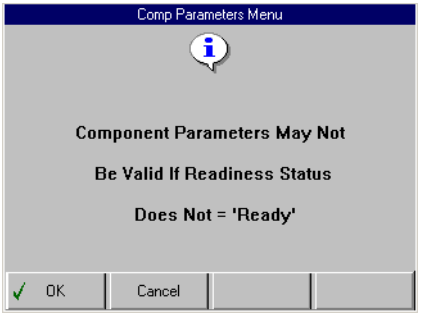


Figure 7.4: Component Parameters Instruction Screen

3 Press the **OK** function key.

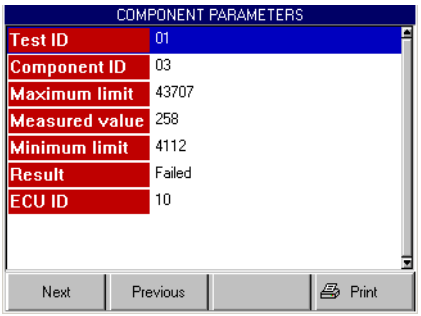


Figure 7.5: Component Parameters Screen

4 View the information for the component. Use the function keys as follows:

- Press the **Next** function key to display information for the next component.
- Press the **Previous** function key to display information for the previous component.
- Use the **Print** function key to optionally print the information.

5 When finished, use the **EXIT** key to return to previous screens.

Oxygen Sensor Tests

The Oxygen Sensor Tests function lets you view data readings for the oxygen (O2) sensor.

IMPORTANT: Warm the engine to operating temperature before doing this test.

1 Follow the steps in "**Basic Procedure**" on page 70 to display the Special Tests Menu screen.

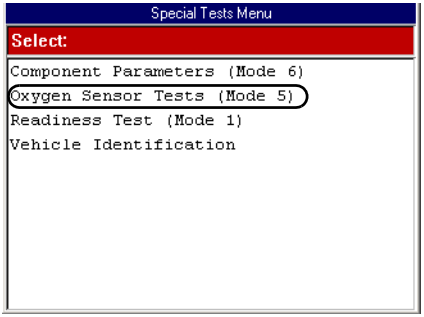


Figure 7.6: Special Tests Menu Screen

2 Select **Oxygen Sensor Tests** and press the **ENTER** key.

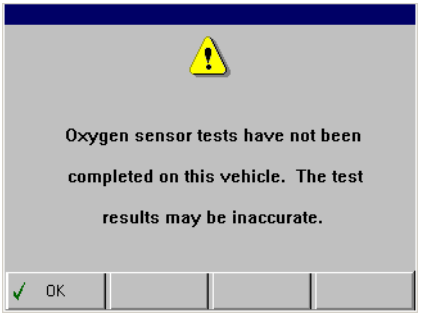


Figure 7.7: Oxygen Sensor Tests Warning Screen

3 If the "Oxygen sensor tests not completed" warning message appears, press the **OK** function key to continue. Otherwise, skip this step.

Note: *If the system tests are not complete, use the EXIT key to return to the Required Cables illustration screen. Then, drive the vehicle around for a few minutes and then start this test again. For more information, refer to "**Readiness Test**" on page 76.*

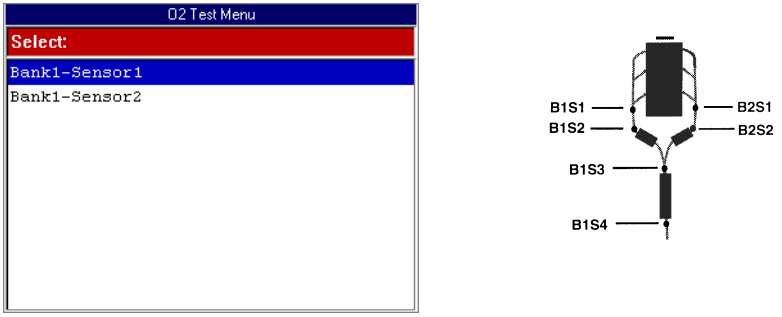


Figure 7.8: O2 Test Menu Screen and O2 Sensor Locations

Note: *The O2 Test Menu screen lists all the bank and sensor combinations available for the vehicle.*

4 Select a **Bank and Sensor** and press the **ENTER** key. This displays the data readings for the selected sensor.

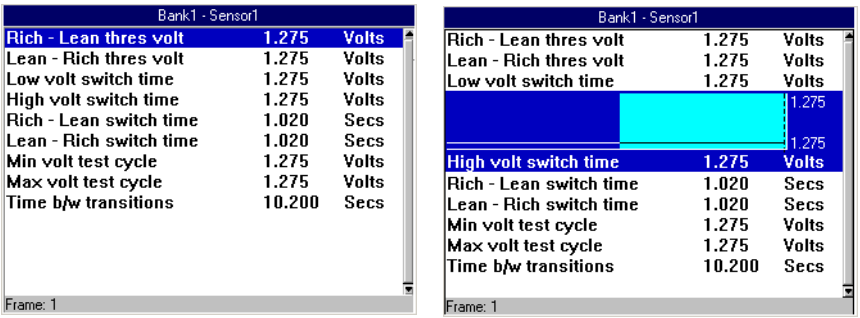

Bank1 - Sensor1
Rich - Lean thres volt 1.275 Volts
Lean - Rich thres volt 1.275 Volts
Low volt switch time 1.275 Volts
High volt switch time 1.275 Volts
Rich - Lean switch time 1.020 Secs
Lean - Rich switch time 1.020 Secs
Min volt test cycle 1.275 Volts
Max volt test cycle 1.275 Volts
Time b/w transitions 10.200 Secs
Frame: 1
Bank1 - Sensor1
Rich - Lean thres volt 1.275 Volts
Lean - Rich thres volt 1.275 Volts
Low volt switch time 1.275 Volts
1.275
1.275
High volt switch time 1.275 Volts
Rich - Lean switch time 1.020 Secs
Lean - Rich switch time 1.020 Secs
Min volt test cycle 1.275 Volts
Max volt test cycle 1.275 Volts
Time b/w transitions 10.200 Secs
Frame: 1

Figure 7.9: Sensor Data Display - Original Display and With One Graphed Line

5 View the sensor data. Optionally, view each line as a graph as follows:

- **a** **Select a line** and press the **ENTER** key.
- **b** Use the **Left Arrow** key and then the **Right Arrow** key to view past data.
- **c** To remove the graph, **select the graphed line** and press the **ENTER** key.

6 When finished viewing the data, use the **EXIT** key to return to previous screens.

Readiness Test

The Readiness Test function lets you view Readiness Test results for all non-continuous and continuous vehicle system monitors as described below.

- Non-continuous vehicle system monitors run a test routine once per drive cycle.
- Continuous vehicle system monitors run a test routine continuously during a drive cycle.

IMPORTANT: Warm the engine to operating temperature before doing this test.

1 Follow the steps in "**Basic Procedure**" on page 70 to display the Special Tests Menu screen.

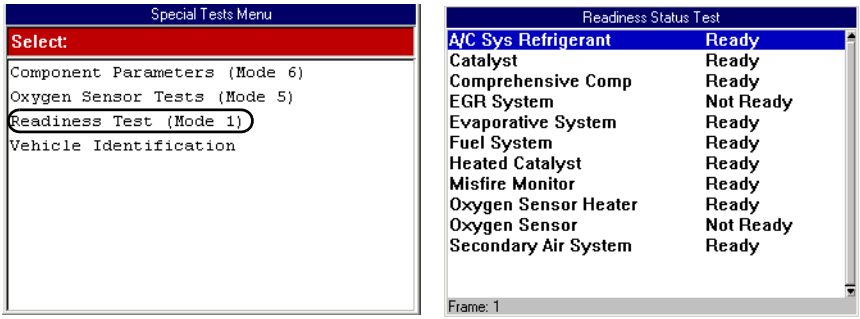


Figure 7.10: Special Tests Menu Screen and Readiness Status Test Screen

2 Select **Readiness Test** and press the **ENTER** key. This displays the Readiness Status Test screen, shown above.

3 Test results display as Ready (complete), Not Ready (not complete), or Failed. View the test results.

Note: *If any tests are not ready, use the EXIT key to return to the Required Cables illustration screen. Then, drive the vehicle around for a few minutes and then start this test again.*

4 Use the **EXIT** key to return to previous screens.

Vehicle Identification

The Vehicle Identification function lets you view the vehicle identification number (VIN) for the vehicle.

1 Follow the steps in "**Basic Procedure**" on page 70 to display the Special Tests Menu screen.

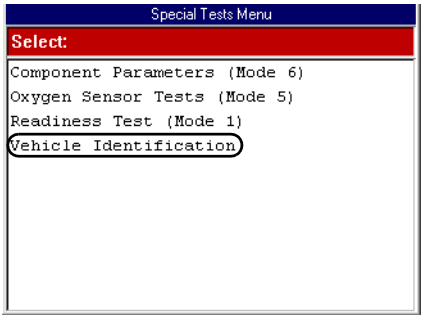


Figure 7.11: Special Tests Menu Screen

2 Select **Vehicle Identification** and press the **ENTER** key. This displays the Vehicle Identification screen.

Figure 7.12: Vehicle Identification Screen

3 View the VIN and press the **OK** function key when finished.

4 Use the **EXIT** key to return to previous screens.

Playback

The Playback function lets you view data recorded with the Datastream Record function (see page 9) and the DTC-Triggered Recording function (see page 22). It also lets you save and delete recorded files.

Note: *You can also upload and view recorded data files on a PC. For details, refer to "ScanMate PC Software"* in the ***Quick Start Guide****.*

1 Make sure the scan tool has power.

Note: *The scan tool does not have to be connected to a vehicle.*

2 Press the **On / Off** button to turn the scan tool on; wait for the Application Manager screen to appear.

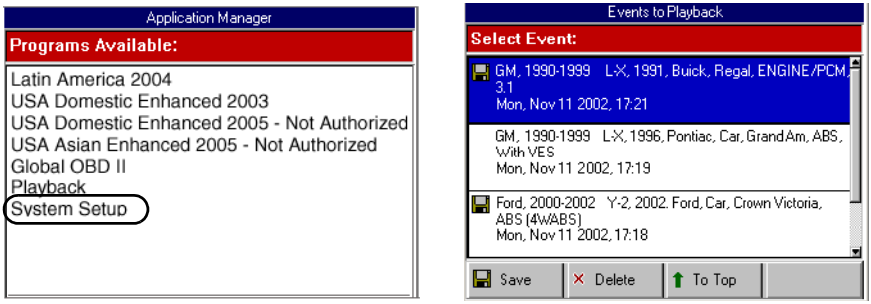

Application Manager
Programs Available:
Latin America 2004
USA Domestic Enhanced 2003
USA Domestic Enhanced 2005 - Not Authorized
USA Asian Enhanced 2005 - Not Authorized
Global OBD II
Playback
System Setup
Events to Playback
Select Event:
GM, 1990-1999 L-X, 1991, Buick, Regal, ENGINE/PCM, 3.1
Mon, Nov 11 2002, 17:21
GM, 1990-1999 L-X, 1996, Pontiac, Car, Grand Am, ABS, With VES
Mon, Nov 11 2002, 17:19
Ford, 2000-2002 Y-2, 2002, Ford, Car, Crown Victoria, ABS (4WABS)
Mon, Nov 11 2002, 17:18
Save
Delete
To Top

Figure 8.1: Application Manager Screen and Events to Playback Screen

3 Select **Playback** and then press the **ENTER** key. This displays the Events to Playback screen, as shown above.

4 Notice the following about the Events to Playback screen:

- The list holds up to five (5) recorded Event files. When the list is full, old recordings automatically delete as you make new recordings. To prevent a recording from being automatically deleted, **select the recording** and press the **Save** function key. This places a disk icon to the left of the file name and saves the recording until you delete it.
- To delete a recording, **select the line** and press the **Delete** function key.
- To move a recording to the top of the list, **select the line** and press the **To Top** function key.

5 From the Events to Playback screen, **select the recorded event** to view and press the **ENTER** key. (The events are identified by the vehicle description, date, and time of the recording.) This displays the recorded event in the Playback screen (*Figure 8.2* on page 79).

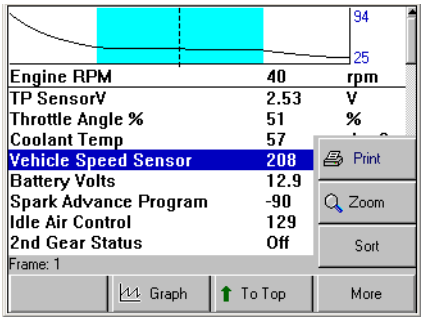


Figure 8.2: Playback Screen

6 Use the **Arrow** keys to view the data. When you use the **Left** and **Right Arrow** keys, the Frame number in the status line changes as you move through the recording.

7 Optionally, use the function keys as follows:

- To display a line as a graph, **select the line** and press the **Graph** function key. The name of the key changes to Digital. To remove the graph, **select the line again** and press the **Digital** function key. For details, refer to "**Graph / Disable (Digital)**" on page 11.
- To move a line to the top of the screen, **select the line** and press the **To Top** function key. Refer to "**To Top**" on page 12.
- To print the data, press the **More** function key and select the **Print** option. For details, refer to "**Print**" on page 16.
- To magnify the view of a line, **select the line**, press the **More** function key, and select the **Zoom** option. For details, refer to "**Zoom**" on page 17.
- To sort the data lines, press the **More** function key and select the **Sort** option. For details, refer to "**Sort**" on page 18.

8 When finished, use the **EXIT** key to return to previous screens.

System Setup

The System Setup functions let you view information about the scan tool and adjust default settings for the scan tool.

Basic Procedure

Use the following steps to access the System Setup functions.

1 Make sure the scan tool has power.

2 Press the **On / Off** button to turn the scan tool on; wait for the Application Manager screen to appear.

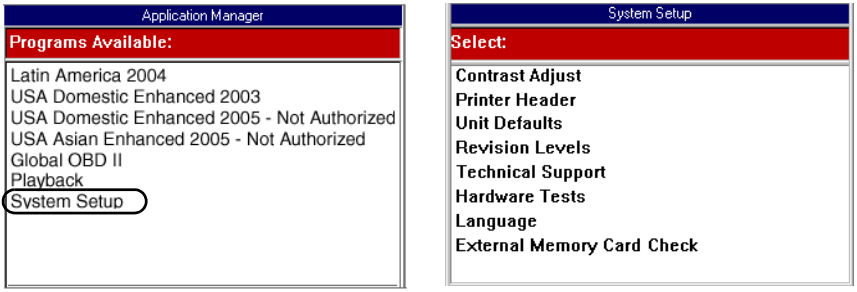


Figure 9.1: Application Manager Screen and System Setup Screen

3 Select **System Setup** and press the **ENTER** key. This displays the System Setup screen, as shown above.

4 **Select the item** to adjust and then press the **ENTER** key.

5 Refer to the following sections:

- "**Contrast Adjust**" on page 81
- "**Printer Header**" on page 82
- "**Unit Defaults**" on page 83
- "**Revision Levels**" on page 84
- "**Technical Support**" on page 85
- "**Hardware Tests**" on page 86
- "**Language**" on page 87
- "**External Memory Card Check**" on page 88

Contrast Adjust

The Contrast Adjust function lets you adjust the contrast of the LCD screen.

1 Follow the steps in "**Basic Procedure**" on page 80 to display the System Setup screen.

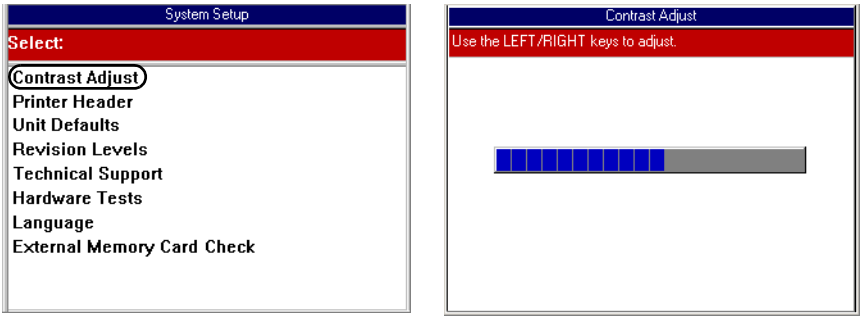


Figure 9.2: System Setup Screen and Contrast Adjust Screen

2 Select **Contrast Adjust** and press the **ENTER** key.

3 Use the **Left** and **Right Arrow** keys to adjust the contrast.

4 Use the **EXIT** key to return to previous screens.

Printer Header

The Print Header function lets you set up a heading for reports that you print from the scan tool.

Note: *You can turn the Print Header function on and off with the Unit Defaults settings. Refer to "**Unit Defaults**" on page 83.*

1 Follow the steps in "**Basic Procedure**" on page 80 to display the System Setup screen.

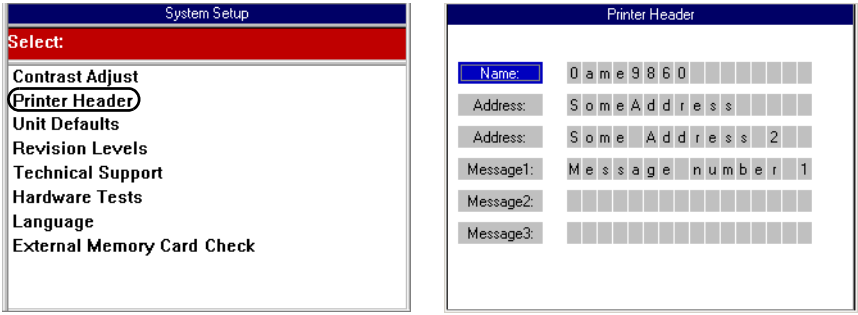


Figure 9.3: System Setup Screen and Printer Header Screen

2 Select **Print Header** and press the **ENTER** key.

3 Use the **Up** and **Down Arrow** keys to select Name, Address, or Message.

4 Press the **Right Arrow** key once to move to the first edit box.

5 Use the **Up** and **Down Arrow** keys to select a character for the box.

Note: *To remove a character and leave a box blank, select the character that is blank (it is between 0 and A).*

6 Press the **Right Arrow** key to select the next box.

Note: *Pressing the Left Arrow key selects the previous box.*

7 Repeat steps 5 and 6 until the line is entered as you want it.

8 Repeatedly press either the **Left** or **Right Arrow** key to return to the Name, Address, or Message box.

9 Repeat steps 3 through 8 until all the information is entered.

10 Use the **EXIT** key to return to previous screens.

Unit Defaults

The Unit Defaults function lets you set the date, time, units-of-measure, and automatic shut down time. It also lets you turn the audible beep and print header functions on or off.

1 Follow the steps in "**Basic Procedure**" on page 80 to display the System Setup screen.

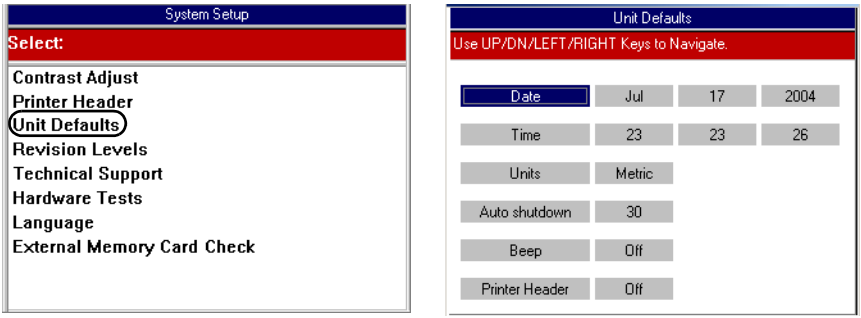


Figure 9.4: System Setup Screen and Unit Defaults Screen

2 Select **Unit Defaults** and press the **ENTER** key.

3 Use the **Up** and **Down Arrow** keys to select the item to set from the far left column:

- **Date —** sets the date in the scan tool as month, date, and year.
- **Time —** sets the time in the scan tool as hours, minutes, and seconds (24 hour clock).
- **Units —** sets the units-of-measure as English or Metric.
- **Auto Shutdown —** sets the amount of time the scan tool stays on before shutting off automatically (only when using internal battery power). This is the amount of time since the last key press. The setting can be made for between 5 and 60 minutes, in 5 minute increments.
- **Beep —** turns the audible beep on or off.
- **Print Header—** turns the print header function on or off. Refer to "**Printer Header**" on page 82.

4 Press the **Right Arrow** key once to move to the edit box.

5 Use the **Up** or **Down Arrow** key to select an option for the box.

6 For Date and Time, repeat steps 4 and 5 to enter the entire date or time.

7 Use the **Left Arrow** key to return to the far left column.

8 Repeat steps 3 through 7 until all the settings are made.

9 Use the **EXIT** key to return to previous screens.

Revision Levels

The Revision Levels function displays software version numbers (for use when calling technical support).

1 Follow the steps in "**Basic Procedure**" on page 80 to display the System Setup screen.

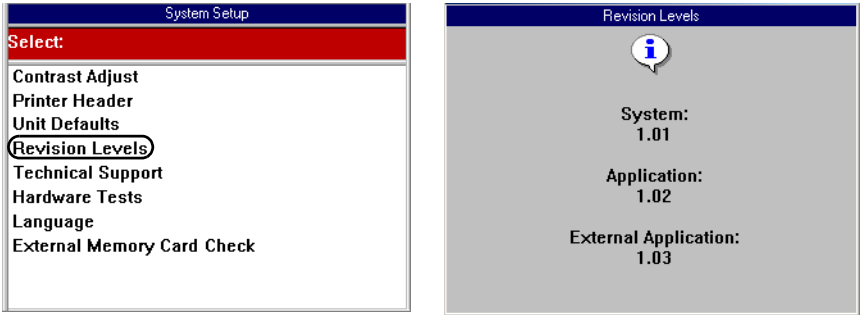


Figure 9.5: System Setup Screen and Revision Levels Screen

2 Select **Revision Levels** and press the **ENTER** key.

3 View the information.

4 Use the **EXIT** key to return to previous screens.

Technical Support

The Technical Support function displays technical support information.

1 Follow the steps in "**Basic Procedure**" on page 80 to display the System Setup screen.

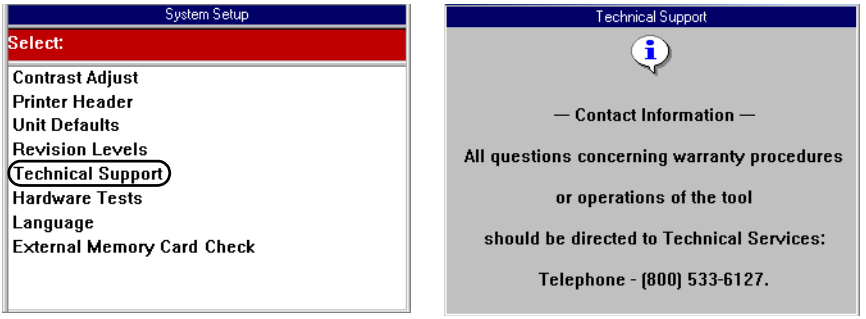


Figure 9.6: System Setup Screen and Technical Support Screen

2 Select **Technical Support** and press the **ENTER** key.

3 View the information.

4 Use the **EXIT** key to return to previous screens.

Hardware Tests

The Hardware Tests function lets you test the LCD screen, keypad keys, and beeper. It also lets you view the time clock and the serial number for the scan tool.

1 Follow the steps in "**Basic Procedure**" on page 80 to display the System Setup screen.

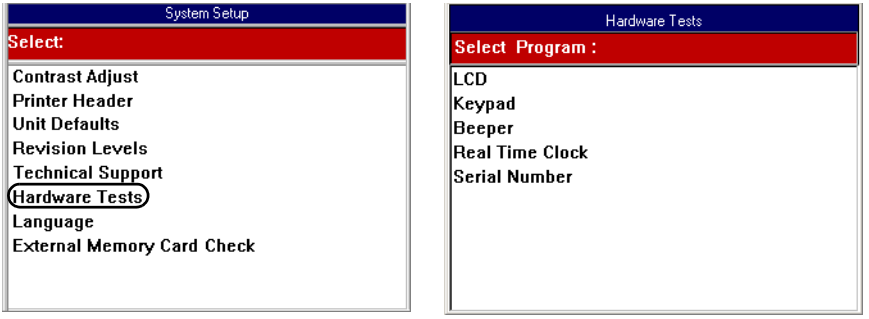


Figure 9.7: System Setup Screen and Hardware Tests Screen

2 Select **Hardware Tests** and press the **ENTER** key.

3 **Select an option** and press the **ENTER** key.

4 Follow the instructions on the screen that appears.

Note: *If you select Keypad, a screen appears with the message "To test the Backlight key, just observe the backlight itself." To display the next screen, press the ENTER key.*

5 When finished with the tests, use the **EXIT** key to return to previous screens.

Language

The Language function lets you set the default language for the scan tool software.

1 Follow the steps in "**Basic Procedure**" on page 80 to display the System Setup screen.

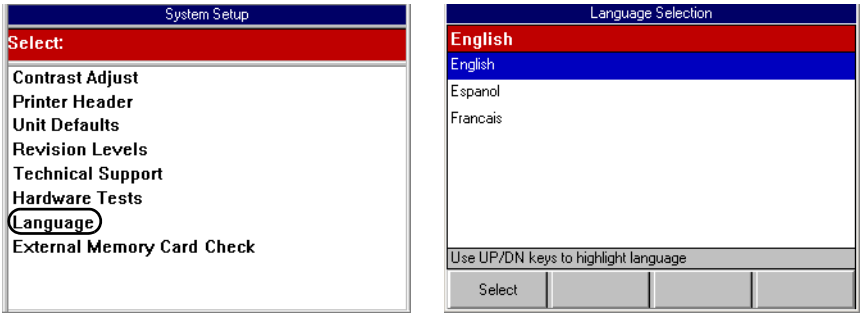


Figure 9.8: System Setup Screen and Language Selection Screen

2 Select **Language** and press the **ENTER** key.

3 Use the **Up** and **Down Arrows** keys to select the language.

4 Press the **Select** function key.

5 Use the **EXIT** key to return to previous screens.

External Memory Card Check

The External Memory Card Check function lets you test the file system on a compact flash card in the compact flash port.

1 Follow the steps in "**Basic Procedure**" on page 80 to display the System Setup screen.

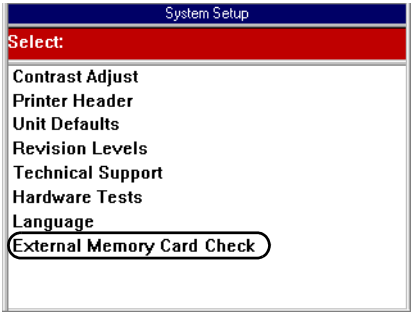


Figure 9.9: System Setup Screen

2 Select **External Memory Card Check** and press the **ENTER** key.

3 Follow any on-screen instructions that appears.

4 Use the **EXIT** key to return to previous screens.

Appendix A: Accessory Components

Several accessory components are available for use with the scan tool. For details, contact your retail or mobile distributor.

Power Adapters

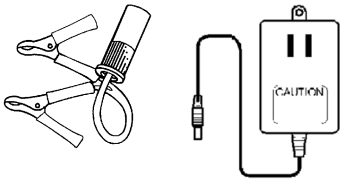


Figure 10.1: Vehicle Battery Adapter (212638) — fits over cigarette lighter power adapter, Vac to Vdc Power Adapter (3421-04) — replaces cigarette lighter power adapter

Cables

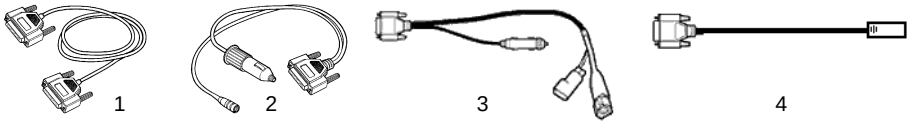


Figure 10.2: 1) Extension Cable (3305-71) - fits between scan tool and DLC cable, 2) DB25 Power Cable (3305-72) - required for some OBD I vehicles, adapters required (see below), 3) Ford ABS Cable (3305-27), and 4) Chrysler III Cable (3305-65)

Cable Adapters

When using the DB25 Power Cable (#2 above), the following cable adapters may be required (the adapters connect between the cable and the vehicle):

- **213596:** Ford MECS adapter for 1988 to 1995 Mazda Engine Control Systems (Aspire, Capri, Escort, Festiva, Probe, and Tracer).
- **3305-14:** Ford MET adapter for 1991 to 1995 Mazda manufactured vehicles.
- **3305-20:** Mitsubishi / Hyundai adapter for Chrysler imports, such as Summit and Colt.
- **3305-74:** Universal “C” Adapter for miscellaneous applications.

When using the Chrysler III Cable (#4 above), the following cable adapter may be required:

- **3305-92:** Chrysler Y Adapter for 1995 Avenger, Sebring, and Talon.

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Service Solutions, A UNIT OF SPX CORPORATION

655 Eisenhower Drive, Owatonna, MN 55060-0095
Phone: 507-455-7000, International Sales: 507-455-7223

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